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BY

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TO

P. C. A. LOUIS, M.D.,

PHYSICIAN TO THE HOTEL DIEU; PERPETUAL PRESIDENT OF THE MEDICAL
SOCIETY OF OBSERVATION, PARIS; MEMBER OF THE NATIONAL
ACADEMY OF MEDICINE, ETC., ETC.

MY DEAR SIR,

In the last edition of your admirable work on Phthisis, you observe—"The study of phthisis under the present point of view—that of its curability—has as yet made but little progress, and consequently does not at the present day possess all the interest which ought to belong to a subject of such great importance. In the cases of cure hitherto known, the morbid state has always been very limited in extent, and this limitation has not been the result of any circumstance which, although fortuitous, was still appreciable, and hence more or less easily producible at will in other cases, but the effect, no doubt, of circumstances peculiar to each individual case. The nature of these circumstances is at the present hour utterly unknown, and to the steady investigation of them medical observers should henceforth sedulously apply themselves."—(*Sydenham Society's Translation, by Walshe, pp. 475, 476*).

If, in following out the recommendation thus given, I have been enabled to collect facts which prove that a cure may occasionally take place, although phthisis has existed to a very great extent; and if, from a consideration of these facts, I have been enabled to approximate towards, if not completely to arrive at, a knowledge of the circumstances which produce a permanent arrestment of the malady, you will perhaps excuse my dedicating this work to you—a liberty to which I am impelled as much by the kindness I have experienced at your hands, as by the distinguished reputation which you have achieved in medicine.

With the utmost respect and regard,

I remain, my dear Sir,

Yours very sincerely,

J. HUGHES BENNETT.

EDINBURGH, 1, GLENFINLAS STREET,
September 22, 1853.

P R E F A C E .

IN the years 1839-40 the Author found a remedy administered in the hospitals of Germany in cases of Pulmonary Tuberculosis, which had never been employed in his own country for that disease, although it had been successfully used there in Rheumatism. This was Cod-liver Oil. He could not fail to be struck with the marked benefits which resulted from its employment in patients who, had they been treated in British hospitals, would certainly have died. In 1841, therefore, he published a Monograph, giving an account of what was then known concerning that substance, and recommended it to his countrymen, from theoretical and practical considerations, as a valuable remedy in Phthisis Pulmonalis.

For five years (1843-1848), the Author held the position of Pathologist to the Royal Infirmary of this city, during which period he performed and recorded the results of upwards of 2000 post-mortem examinations. Gradually one great fact became impressed upon his mind, viz., that all organic diseases occasionally presented a tendency to spon-

taneous cure. He was repeatedly meeting with instances where, although death was occasioned by disease in one organ, there were others which presented traces of previously existing lesions which in some way had healed. In no organs were such appearances more common than in the lungs, and of no disease was evidence of a spontaneous cure more frequent than of Pulmonary Tuberculosis.

Although it was generally considered by the profession that no remedy and no plan of treatment yet proposed could be depended on in cases of consumption, it was obvious to the Author that if the process employed by nature could be discovered, and then imitated by art, we might ultimately arrive at the true principle of cure. Whenever, therefore, decided and unmistakeable evidence of a spontaneous cure came before him, he carefully studied the circumstances which preceded it; and connecting these with the numerous observations which were simultaneously going on, as to the good effects of Cod-liver Oil, he was gradually led to the rules of treatment which are developed in the following pages. These he has tested on a large scale in hospital and private practice. They have also been extensively tried by others who have followed his suggestions, so that he can now confidently recommend them to his professional brethren.

It may happen, however, that the practical rules and the principles on which they are founded are no longer new to some who may read the following pages. This will be accounted for if it be remembered that during the last twelve years the Author has published various papers in connection with Tubercle and Pulmonary Tuberculosis, the substance of

which is embodied in the present work.¹ For the last eleven years also he has been constantly engaged in giving lectures, both on the Theory and Practice of Medicine, systematically and clinically, and has naturally communicated to his pupils the various facts and views now set forth, as they were gradually arrived at or reached maturity in his own mind. Further, it may be observed in some places that the language and ideas are similar to those long since published in certain Reviews, which have appeared in the "Monthly Journal of Medical Science," and whenever these are identical, it

¹ The Author is not disposed to enter into controversy with regard to a mere question of priority; but with the object of regulating any discussion on this point, should it arise, he appends a list of his contributions to the pathology and treatment of tuberculosis, with the dates of their publication.

1. *Treatise on the Oleum Jecoris Aselli or Cod-liver Oil, as a Therapeutic Agent in certain forms of Gout, Rheumatism, and Scrofula, with Cases.* London and Edinburgh. 1 vol. 8vo. 1841.
2. *Description of a Cryptogamic Plant found Growing in the Sputa and Lungs of a Man who laboured under Pneumothorax.*—"Transactions of the Royal Society of Edinburgh." 1842.
3. *On the frequent Spontaneous Cure of Pulmonary Consumption, and the indications furnished by Pathology for its Rational Treatment.*—"Edinburgh Medical and Surgical Journal." 1845.
4. *On the Minute Structure and Chemical Composition of Tubercular Deposits.* 6 woodcuts.—"Northern Journal of Medicine." 1846.
5. *On the Elementary Forms of Disease.* Woodcuts. —"Monthly Journal of Medical Science." 1846.

may be assumed with truth that he is the writer of those Reviews.

In 1849, Dr C. T. B. Williams, of London, published a paper on the treatment of Phthisis Pulmonalis by Cod-liver Oil, in which he confirmed all that the Author had stated eight years previously as to the therapeutic effects of that remedy. Dr Williams also adopted the molecular theory of its action which the Author published in November 1847. Unfortunately, in adopting his theory as well as practice, Dr Williams seems to have imagined that he had arrived at some-

-
6. *On the Structural Relation of Oil and Albumen in the Animal Economy, etc.*—"Read to the Royal Society of Edinburgh," 19th April 1847; "Proceedings of the Royal Society of Edinburgh, 1846-7;" and "Monthly Journal of Medical Science," September 1847.
 7. *Appendix to the Treatise on the Oleum Jecoris Ascelli.* 8vo. November 1847. •
 8. *On Cancerous and Cancroid Growths.* 1 vol. 8vo. Numerous Woodcuts. Edinburgh. 1849. See pp. 195-7 and pp. 204-6.
 9. *On the Course of Tubercle in the Lungs.*—"Monthly Journal of Medical Science." 1849.
 10. *On Simple Tubercular and Cancerous Exudations—their Pathology and General Treatment.*—"Monthly Journal of Medical Science," February 1850.
 11. *On the Treatment of Phthisis Pulmonalis.* 2 Coloured Plates. "Monthly Journal of Medical Science." 1850.
 12. *Report on the Cases of Pulmonary Diseases treated in the Clinical Wards of the Royal Infirmary, during the latter half of the Summer Session 1851.*—"Monthly Journal of Medical Science," December, January, and February. Nos. 1851-52.
 13. *Illustrations of Laryngeal and Pharyngeal Diseases, which are frequently mistaken for, or associated with, Phthisis Pulmonalis.*—"Monthly Journal of Medical Science." December 1852.

thing new — a conclusion which, as it has been very ably dealt with by a critic in the “Dublin Quarterly Journal of Medical Science” for May 1850, demands no further notice. There can be no doubt, however, that Dr Williams’ confirmation of the Author’s experience (although tardy), still further supported by an able Report of the Medical Officers of the Brompton Consumptive Hospital in 1851, and the concurrent testimony of several Hospital Physicians, tended to extend the confidence of the profession in its use, which has since become as general in England as it had long previously been in Scotland.

Any well-informed medical practitioner who looks back on the treatment of Phthisis as it existed ten years ago, and compares it with the practice recommended in this work, must come to the conclusion that the one is essentially different from the other. The Author has attempted to show, 1st, That tubercular diseases will heal of themselves, if the faulty nutrition of the system can be removed ; 2dly, That with this object our efforts should be directed to the digestive rather than to the respiratory system ; and 3dly, That the kind of abnormal nutrition which exists is dependent on increased assimilation of the albuminous, and diminished assimilation of the fatty portions of the food. Hence he recommends that the general plan of treatment should be to cause the reception of the deficient elements of nutrition, and is therefore not tonic or stimulating, but *analeptic* (from *αναλαμβάνω*, to restore). With regard to the symptomatology, morbid anatomy, and diagnosis of Pulmonary Tuberculosis, he has nothing to add to the many masterly works which treat of those parts of the subject, and

consequently he has not entered into them further than was necessary to evolve the principles on which he considers a correct treatment should be based. But if he has been fortunate enough to show that such treatment is founded on a true pathology, and that a class of diseases which destroys one sixth of the population in this country may in any way be alleviated, he leaves to the candour of his medical brethren the question of how far he has been instrumental in effecting it.

JOHN HUGHES BENNETT.

EDINBURGH, 1, GLENFINLAS STREET,

Sept. 22, 1853.

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ON PULMONARY TUBERCULOSIS.

CHAPTER I.

PATHOLOGY OF PULMONARY TUBERCULOSIS.

It has been noticed by many observing physicians, and especially by Sir James Clarke, that phthisis pulmonalis is ushered in with a bad and capricious appetite, a furred or morbidly clean tongue, unusual acidity of the stomach and alimentary canal, anorexia, constipation alternating with diarrhœa, and a variety of symptoms denominated dyspeptic, or referable to a deranged state of the primæ viæ. Moreover, it can scarcely be denied that, in the great majority of cases, these are the symptoms which accompany phthisis throughout its progress, becoming more and more violent towards its termination. Now, as the nutritive properties of the blood are entirely dependent on a proper assimilation of food, and as this assimilation must be interfered with in the morbid conditions of the alimentary canal, the continuance of such conditions necessarily induces an impoverished state of that fluid, and imperfect growth of the tissues. When, under such circumstances, exudations of the liquor sanguinis occur, they are very liable to assume the form of tubercles, and if they are poured into the lungs, there are then produced those changes and that condition which have been denominated by the German pathologists pulmonary tuberculosis.

The term tubercle is of Latin derivation, and literally implies a little swelling. In this sense it is still used by dermatologists, and serves to distinguish a class of skin diseases. The same name was unfortunately applied to the rounded

masses so frequently found in the lungs or other organs. It has also been employed to characterise the same substance when infiltrated in masses, or under circumstances where its original signification cannot apply. At present, tubercle is generally considered to be a peculiar morbid deposit, sometimes grey, but more frequently of a yellowish colour, varying in size, form, and consistence, which sooner or later undergoes a process of softening.

This definition of tubercle is very vague, and may be applied to various kinds of exudation which materially differ from each other. Indeed every morbid anatomist must frequently have experienced much difficulty in endeavouring to determine by the naked sight whether a certain morbid deposit be or be not tubercle. With a view to establishing a correct pathology therefore, our first efforts must be directed to determine what tubercle really is; how it can be accurately separated from the ordinary products of inflammation on the one hand, and from malignant or other morbid growths on the other. To arrive at these points we must inquire into the minute structure and chemical constitution of this substance.

SECTION I.

Histology of Tubercle.

Tubercle has been spoken of as presenting a miliary, infiltrated, or encysted form; but these distinctions have no reference to structure, but merely to the extent and age of the exudation. It generally presents a yellowish or dirty white colour, and varies in consistence from that of a substance resembling tough cheese to that of cream. Sometimes it is soft at one place and indurated at another. On section, when tough, it presents a smooth or waxy, and when soft, a slightly granular, surface. On pressure it is friable, and may break down into a pulpy matter, but never yields a milky juice.

A small fragment of tolerably firm miliary tubercle, squeezed between glasses with a drop of water, and examined under a magnifying power of 250 diameters linear, presents a number of irregular shaped bodies, approaching a round, oval, or tri-

angular form, varying in their longest diameters from the $\frac{1}{4000}$ to the $\frac{1}{2000}$ of an inch. These are the so-called *tubercle corpuscles*. They are composed of a distinct wall, containing generally three or more granules, without any distinct nucleus, and are mixed with numerous granules and molecules, varying in size from a point scarcely measurable, to the $\frac{1}{6000}$ of an inch in diameter (Fig. 1, *a*). If we add to these bodies a drop of weak acetic acid, all the corpuscles become more transparent, but are otherwise unchanged, and many of the granules disappear, as in Fig. 1 (*b*). Ether and alcohol produce little change. Ammonia partially dissolves the corpuscles, and renders them capable of being easily broken down. They are immediately and completely dissolved in a solution of potash.

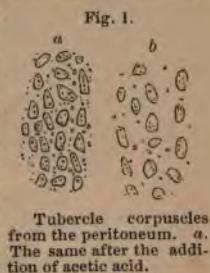


Fig. 1.
Tubercle corpuscles from the peritoneum. *a*. The same after the addition of acetic acid.

Again, if we simply squeeze a portion of soft yellow tubercle between glasses, and examine it with a like magnifying power, we shall see similar corpuscles, mixed with numerous molecules and granules, as in Fig. 2. Sometimes softened tubercle seems partially or wholly composed of a granular matter. At others, we only observe it to be molecular, the molecules being exceedingly minute. In some forms of tubercle, the corpuscles are much larger and rounder than they are represented in Fig. 2, still, however, preserving their peculiar character, as in Fig. 3. In this manner, they approach in form to the corpuscles observed in scrofulous pus.



Fig. 2.
Tubercle corpuscles, granules, and molecules, from a soft tubercular mass in the lung. 250 diameters linear.



Fig. 3. Tubercle corpuscles from a mesenteric gland. 250 diameters linear.

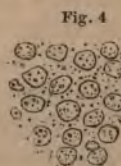


Fig. 4. Scrofulous pus from a lymphatic gland. 250 diameters linear.

The grey semi-transparent granulation is of semi-cartilaginous hardness, and presents to the eye a very different appearance from ordinary tubercle. On making a thin section

Fig. 5.

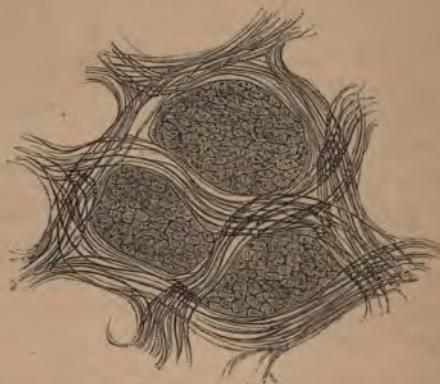


Fig. 5. Section of a grey granulation in the lung after the addition of acetic acid, showing the pulmonary air vesicles filled with tubercle corpuscles. 250 diam. linear.

of it, however, it will be found to be composed of similar elements, although more transparent and not so well defined. The addition of acetic acid, by rendering the fibrous tissue more transparent, and dissolving the granules, will permit the same corpuscles to be seen in it as are represented in Fig. 1.

When tubercle presents the cretaceous or calcareous transformation in any degree, the different elements we have described become mixed up with hard gritty particles of earthy salts. These are of irregular form and size, and are larger and numerous in proportion as the tubercle is more and more calcareous. Crystals of cholestrine may also frequently be seen in cretaceous concretions (Fig. 6). When tubercle is converted into a mass of stony hardness, a thin section presents a granular appearance, made up of a congeries of minute earthy particles, without any distinct form. We frequently

Fig 6.



Fig. 6. Fragments of phosphate of lime, crystals of cholestrine, and tubercle corpuscles, from a cretaceous mass in the lungs.

find tubercle conjoined with more or less pigmentary matter. This usually appears under the microscope in the form of irregular black masses (Fig. 7, *a*), which are composed of exceedingly minute molecules (*b*). These molecules may be occasionally seen infiltrated into many of the tissues, and among morbid deposits, especially tubercle. They often surround the minute tubercles deposited on the surface of the peritoneum, as in Fig. 7. Their occurrence in considerable masses round chronic tubercle in the lung or bronchial glands, is almost uniform, giving a black or bluish tinge to the tissues. Indeed, it may be said that the older the tubercle, the greater is the amount of pigmentary matter surrounding it. In the lungs and bronchial glands, however, the black pigment, although it resembles that observed in the peritoneum morphologically, differs from it chemically. In the former case, it is pure charcoal, and indestructible by all chemical reagents; whereas, in the latter, the colouring matter disappears under the action of mineral acids, and an immersion for some time in alcohol. A portion of intestine sprinkled over externally with miliary tubercles, surrounded by a black ring, one of which is represented magnified 250 diameters (Fig. 7), was put up by me in alcohol as a preparation, and in three weeks the black pigment had entirely disappeared.

From what has preceded, it must be evident that tubercle presents different appearances, according as it is hard or soft, cretaceous or calcareous. When recent and hard, the corpuscles are crowded together, and the granules accompanying them are comparatively few in number. When soft, the number of granules is much increased, and the corpuscles are easily separated. Lebert¹ is of opinion that at first the cor-



Fig. 7. Corpuscles mixed with pigmentary matter, in a small tubercle taken from the peritoneum. (*a*), Irregular masses of black matter, which may be broken down into (*b*) granular and molecular matter. 250 diameters linear.

¹ *Physiologie Pathologique*, p. 527, *et seq.*

puscles are kept together by an intermediate substance, which afterwards softens. We can only regard this interglobular substance as the blastema in which the corpuscles are formed. The softening, then, is more probably owing to the development and breaking down of the latter, similar to what we observe in inflammatory exudations generally.

Gulliver¹ and Vogel² agree in saying, that at an early period, more especially when in a miliary form, nucleated cells may be observed in tubercular matter. This is denied by Lebert, and I must confess that I have never been able to discover nuclei in the corpuscles of tubercle. They appear to me to be nuclei themselves, which are formed slowly, and have no tendency to produce cells, before they break down into a molecular matter. Hence no danger is to be apprehended from the spread of tubercle itself by an inherent power of growth, and if fresh deposits could be prevented, the tendency of this substance to disintegration, is highly favourable to its absorption. Schroeder Van der Kolk also supposes them to be nuclei;

Fig. 8.



Fig. 9.



Fig. 8. Structure of the central portion of a tubercular mass, embedded in the cerebellum.
Fig. 9. Structure of the external portion of the same mass, where it was in contact with softened cerebellar substance. 250 diameters linear.

but considers that they result from the disintegration of epithelial cells in the ultimate bronchi and air-vesicles—a view which seems to me negatived by the fact that they occur in textures destitute of epithelium, as in the substance of the brain (Figs. 8 and 9).

¹ Gerber's Anatomy, Appendix, p. 85.

² Icones Histologicæ, Tab. 4.

Numerous instances occur in which it is utterly impossible to distinguish tubercle from fibrinous exudations on the one hand, or cancerous growths on the other, except by paying attention to the minute structure previously described. I have often been deceived in endeavouring to determine this by naked sight, and found on a microscopic examination, that so-called tubercular masses were composed of filaments more or less mixed up with plastic or granular corpuscles. Again, not unfrequently tubercle has been mistaken for cancer, or the latter for the former. If, then, we are asked to determine what is positively tubercle, as distinguished from all other morbid products, we must answer, that deposition which is composed of the peculiar corpuscles and granules described and figured in the preceding pages. From pus corpuscles they are readily distinguished by the action of acetic acid, which in them causes no granular nucleus to appear. From plastic corpuscles they may be separated by their irregular form, smaller size, and the absence of primitive filaments. With the granular corpuscle they can scarcely ever be confounded, on account of its large size, brownish or blackish colour, and nucleated or granular structure. The cells of cancer are large, transparent, and distinctly nucleated, and consequently easily distinguished from the small, non-nucleated corpuscles of tubercle. The general characters of these different corpuscles will be gathered from a glance at the accompanying figures.

Fig. 10.

Fig. 11.

Fig. 12.

Fig. 13.

Fig. 14.



Fig. 10. Tubercle corpuscles from the lung. Fig. 11. Pus corpuscles. One shows the double granular nucleus after the addition of acetic acid. Fig. 12. Plastic or pyoid corpuscles. Fig. 13. Granular corpuscles from cerebral softening. Fig. 14. Cancer cells from the uterus. 250 diameters linear.

The only other structure likely to be confounded with tubercle is the reticulum of cancer, which not only presents a

yellowish appearance closely resembling it, but is composed of nuclei and molecular matter, resulting from the disintegration of cancer cells. But, as this reticulum is always associated with cancerous formation, it may at once be distinguished by the cell elements which accompany it. It should further be noticed that every form of exudation, at a certain period, presents a molecular and granular structure throughout, and that then it becomes impossible to determine its nature, unless it be associated with the more characteristic elements distinctive of the simple, tubercular, or cancerous exudations.

Fig. 15.



Corpuscles, etc.,
in the reticulum of
cancer. 250 diam.

As regards chemical composition, Dr Abercrombie¹ showed that a mass of tubercle, on being plunged into boiling water, contracted and became more dense and firm, when it presented all the characters of coagulated albumen. This was well observed in the mesenteric glands, which, when only slightly affected, lost a considerable amount of their weight. This loss became less and less as the tubercular deposition increased, until at length the whole gland appeared to be converted into solid coagulated albumen, and scarcely lost any of its weight by boiling.

Dr Abercrombie observes, "the deposition of albumen, therefore, in these glands, appears to be a process of disease. In the early stages of the disease it seems to be deposited in a soft state, and to be involved in the structure of the gland; the gland, in other respects, being vascular and organised, and probably capable of performing its functions. It is in this state that we see the albumen coagulated, when the gland is plunged into boiling water, producing so immediate and remarkable a change in its appearance and texture. As the disease advances, the proportion of albumen seems to increase, while, at the same time, it assumes a more concrete state, and the mass in general becomes less vascular and less organised.

¹ Medico-Chirurgical Transactions of Edinburgh, vol. i., p. 887.

In the last stage, the vascular structure of the gland seems more and more to disappear, until it passes into a mass presenting the properties of coagulated albumen, with little or no organisation."

Tubercle has farther been made the subject of special analysis by Thénard,¹ Hecht,² Lassaigne,³ Preuss,⁴ Gueterboeck,⁵ Wood,⁶ Simon,⁷ Scherer,⁸ Felix Boudet,⁹ Wright,¹⁰ and especially by Dr Glover of Newcastle,¹¹ from whose various analyses, the following conclusions may be drawn:—

1st, That tubercle consists of an animal matter, mixed with certain earthy salts.

2d, That the relative proportion of these varies in different specimens of tubercle. That animal matter is most abundant in recent and earthy salts in chronic tubercle.

3d, That the animal matter certainly contains a large amount of albumen. Some chemists have also detected caseine, the existence of which is probable; others gelatine, the presence of which is more doubtful. The statement of Gueterboeck, that it contains a peculiar animal matter (phy-matine), has not been confirmed by other analysts. Fibrin and fat exist in small but variable proportion, as a constituent of tubercle.

4th, The earthy salts are principally composed of the insoluble phosphate and carbonate of lime, with a small proportion of the soluble salts of soda. The statement of Boudet, that cretaceous concretions are principally formed of the latter,

¹ Andral. *Precis d'Anatomique Pathologique*, t. i., p. 417. 1829.

² *Traité d'Anatomie Pathologique*, 1829, t. i., p. 378.

³ Dupuy, *Journal Prat. de Med. Veterinaire*, 1838, p. 98.

⁴ *Tuberculorum pulmonis crudorum analysis chemica*. Dissert. Berol, 1835.

⁵ *De pure et granulatione*. Berol, 1837.

⁶ *De puris natura atque formatione*. Berol, 1837.

⁷ *Animal Chemistry*, 1842. Trans. by Day, 1846, vol. ii., p. 478.

⁸ *Jahresbericht von Canstatt*, 1844. *Leistungen in der Pathologischen Chemie von Scherer*.

⁹ *Bulletin de l'Acad. Roy. de Medecine*, t. ix., p. 1163.

¹⁰ *Medical Times*, vol. ii., pp. 418, 419.

¹¹ *Pathology and Treatment of Scrofula*, 1846, p. 54, *et seq.*

is directly opposed by other chemists, and is quite incompatible with their long persistence in the body.

5th, That very little difference in ultimate composition has yet been detected between recent tubercle, and other so-called compounds of protein.

SECTION II.

The Nature of Tubercle.

If, from the histological facts previously stated, we seek to deduce the nature of tubercle, it can scarcely be doubted that it is an exudation of the liquor sanguinis, but one which presents marked differences from the simple or inflammatory exudation on the one hand, and the cancerous exudation on the other. Thus:—

We observe, in a simple or inflammatory exudation, that it may occur at all epochs in life; that it may attack all tissues, and most commonly those which are very vascular; that it may be poured out in large or small quantities; and that it may occur with greater or less rapidity—hence the terms acute and chronic. We further observe, that the acute exudations are generally attended with symptoms of a peculiar character (inflammatory), and have a great tendency to cell or temporary formations, which rapidly break down, are absorbed, and excreted by the emunctories: that the chronic exudations, on the other hand, have a tendency to fibrous or permanent formations, producing adhesions, strictures, hypertrophies, etc.

We observe, in a cancerous exudation, that it occurs for the most part in persons of adult or advanced life; that it may also occur in every tissue, but is by far most common in glandular or fatty organs, such as the liver or female mamma, and is very apt to attack the lymphatic glands *secondarily*; that its progress, although sometimes slow when very fibrous, becomes rapid when corpuscles abound in it; that there is a great tendency to the formation of the most perfect forms of

cell life, which have the power of self-development, and thereby of spreading to neighbouring tissues; and lastly, that when, by pressure, ulceration is produced on free surfaces, it bursts through these in exuberant fungoid excrescences.

We observe, in a tubercular exudation, that it occurs for the most part in young subjects, between the periods of dentition and of adult age; that it may also occur in all tissues, but is by far most common *primarily* in the lymphatic glands, and afterwards in fibrous or albuminous textures, as the lungs and serous surfaces; that its progress is generally exceedingly slow; that there is no disposition to the formation of perfect cell-formation, but rather to abortive corpuscles, which form slowly, and slowly break down; that there is little tendency to absorption, but great liability to disintegration and ulceration; and finally, that the local changes are almost always preceded by derangement of the *primæ viæ*, and a group of symptoms known under the name of dyspepsia.

Taking, then, the products of simple inflammation (say pus) as a standard, we cannot fail to remark, that whilst the cell development of tubercle is below, that of cancer is above, this standard. Of the three kinds of exudation, tubercle is the lowest, and cancer the highest, in the scale.

On what this difference in the formative power of the exudation depends, we are ignorant, but every kind of reasoning must lead us to the conclusion, that these different changes and effects depend, not upon the vascular system, which is the mere apparatus for the production of exudation; not upon the nervous system, which conducts impressions to and from this apparatus; and not on the texture, which is the seat of the exudation, as that varies, whilst the cancerous or tubercular formation is the same—but on the inherent composition or constitution of the exudation itself. On this point most pathologists are agreed, and hence the supposed existence of various kinds of dyscrasiæ, originating in the blood, which, it is imagined, explain the different results produced. But here pathologists pause—having once traced these lesions back to the blood, they are content; and they have not sufficiently taken into consideration, that the blood itself is dependent for

its constitution on the results of the primary digestion in the alimentary canal on the one hand, and the secondary digestion in the tissues on the other. Yet it must be evident to every physiologist, that if it be the constitution of the blood which determines that of the exudation, the causes which produce this must be sought in those circumstances which operate on the composition of the former fluid.

Now, numerous facts render it probable that while the blood is normal in simple exudation, it contains an excess of nutritive materials in cancerous, and a deficiency of them in tubercular, exudation. These are points, however, which can only be established after examining instances of such exudations in detail. But it must not be forgotten, in the meantime, that as the blood is continually undergoing changes; is receiving and giving off new matters, it can scarcely happen that it remains the same for many hours together. An exudation at one time may be very different from that at another. At one period it may abound in elements which do not exist in it at the next. Hence it may often happen that a concurrence of circumstances is necessary to occasion a certain result. A cancer once formed may remain local until such a concurrence of events arises, comprising, first, a peculiar constitution of the blood; secondly, the phenomena leading to and producing an exudation; and thirdly, the occurrence of this exudation in some tissue or organ sufficiently predisposed for the purpose. Hence why the histologist is continually finding all kinds of intermediate formations between the three leading kinds of exudation, and why, even when the constitution is thoroughly tubercular or cancerous, simple exudations may be poured into tissues as the result of recent wounds or injuries. But, whilst a recent tubercular or a cancerous exudation may be found to accompany, or alternate with, a simple exudation, they are seldom, if ever, met with together—a circumstance which still further points out the wide difference between the constitutional causes producing them.

The views now advanced dispose of the disputes formerly so prevalent among pathologists as to the inflammatory or

non-inflammatory nature of tubercle. If by inflammation be understood pain, heat, redness, and swelling, or the presence of lymph and pus, then certainly tubercle is not inflammatory. But if we consider inflammation to be an exudation of the blood plasma, then it, as well as lymph and cancer, are inflammatory products. The modern view of considering all these pathological states to be only different forms of exudation, is the only one which is consistent with our knowledge of existing facts, which reconciles past and present observations, and holds out general principles on which our treatment may be based. Indeed, the modern histologist would be at a loss to understand why so much importance should have been attached to the question of the inflammatory or non-inflammatory origin of tubercle, were he not aware that the former idea has been associated in the minds of practitioners with bleeding, low diet, and tartar emetic, as remedies.

In the same manner, the slightest consideration of tubercle as a coagulated exudation, must point out that it must have the same seat as all other exudations. It transudes in a fluid state through the capillaries, and collects in those places outside the vessels that offer least resistance. Thus, in the lungs, although a small portion may insinuate itself between the elementary fibres of the pulmonary structure, it will principally pass into the air vesicles, and by coagulating in them, obstruct the entrance of air. Hence numerous specimens in my histological collection show the tubercular to hold exactly the same position in the lungs as the simple and cancerous exudations.

If now we endeavour to inquire more particularly into the nature of that change in the blood which communicates to the exudations from it those peculiar characters we denominate tubercular, we must arrive at our knowledge from the results of physiological researches. Thus, a healthy nutrition of the body cannot proceed without a proper admixture of mineral albuminous and oleaginous elements. This may be inferred from the physiological experiments of Tiedemann and Gmelin, Leuret and Lassaigne, Magendie, and others; from an observation of the constituents of milk, the natural food of young

mammiferous animals; from a knowledge of the contents of the egg, which constitute the source from which the tissues of oviparous animals are formed before the shell is broken; and from all that we know of the principles contained in the food of adult animals. The researches of chemists, such as those of Prout, Liebig, and others, point to the same generalisation, when they assert that carbonised and nitrogenised, or, as they are now called, respiratory and sanguigenous food, are necessary to carry on nutrition, inasmuch as oil is a type of the one, and albumen of the other, while the mineral matter is dissolved in both. The chemical theory is imperfect, however, because it does not indicate *how* these elements form the tissues; for it is not every form of carbonised or of albuminous food that is nutritious, but only such kinds of them as are convertible into oil and albumen.

The reason of this was first pointed out by Dr Ascherson of Berlin, in 1840, and made known by me to the profession in this country in 1841. I have since endeavoured to show,¹ that the elementary molecules formed of a particle of oil, surrounded by a layer of albumen, which are produced, as he described, by rubbing these two substances together, are not developed directly into blood-globules and other tissues, as he supposed, but must first pass through a series of transformations—a knowledge of which is highly important, not only to a comprehension of nutrition generally, but especially to that abnormal condition of it which occurs in phthisis. Thus the successive changes which occur for the purposes of assimilation in the healthy economy may be shortly enumerated as follows:—1st, Introduction into the stomach and alimentary canal of organic matter; 2d, Its transformation by the process of digestion into albuminous and oily compounds: this process is chemical; 3d, The imbibition of these through the mucous membrane in a fluid state, and their union in the termini of the villi and lacteals to form elementary molecules: this process is physical; 4th, The transformation of these, first,

¹ On the Structural Relation of Oil and Albumen in the Animal Economy. Read to the Royal Society of Edinburgh, April 19, 1847.

into chyle corpuscles, and, secondly, into those of blood, through the agency of the lymphatic glandular system: which is a vital process. It is from this fluid, still further elaborated in numerous ways, that the nutritive materials of the tissues are derived, so that it must be evident, if the first steps of the process are improperly performed, the subsequent ones must also be interfered with. Hence we can readily comprehend how an improper quantity or quality of food, by diminishing the number of the elementary nutritive molecules, must impede nutrition.

When we examine a drop of chyle taken from the thoracic duct of an animal, three hours after it has eaten a meal, we observe, that it contains, first, a molecular basis (Gulliver) of incalculably minute particles; and secondly, numerous corpuscles in different stages of development into blood globules. This molecular basis has been proved by numerous chemical analyses to consist principally of fat, emulsified by its admixture with albumen. In short, these two important principles, fat and albumen, constitute essential elements of the nutritive chyme; and the former divided into exceedingly minute particles by the latter, pass through the villi and form the milky fluid called chyle. It is unnecessary for me to trace the subsequent changes this chyle undergoes by its passage through the mesenteric glands, and the successive stages of elaboration produced in it by the operation of the blood, glands, and the lungs. No one can doubt that the oil and albumen so derived from the food, and so altered chemically and mechanically in the body, constitute the material from which blood is formed; neither can there be any question that the presence and emulsification of these elements in proper proportions, are absolutely necessary to supply and keep up the vital properties of the blood.



Fig. 16.
Chyle from the thoracic duct of a dog three hours after eating a meal. *a*, Fluid chyle showing its molecular basis and corpuscles in various stages of development into those of blood. *b*, Corpuscles of chyle embedded in fibrillated fibrine. They are round in the centre, but more or less compressed and elongated towards the margin. 250 diam.

The peculiarity of phthisis, however, is, that an excess of acidity exists in the alimentary canal,¹ whereby the albuminous constituents of the food are rendered easily soluble, whilst the alkaline secretions of the saliva and of the pancreatic juice are more than neutralised, and rendered incapable either of transforming the carbonaceous constituents of vegetable food into oil, or of so preparing fatty matters introduced into the system, as will render them easily assimilable. Hence an increased amount of albumen enters the blood, and has been found to exist there by all chemical analysts, while fat is largely supplied by the absorption of the adipose tissues of the body, causing the emaciation which characterises the disease. In the meanwhile, the lungs become especially liable to local congestions, leading to exudation of an albuminous kind, which is tubercle. This, in its turn, being deficient in the necessary proportion of fatty matter, elementary molecules are not formed so as to constitute nuclei capable of further development into cells,—they therefore remain abortive, and constitute tubercle corpuscles. Thus a local disease is added to the constitutional disorder, and that compound affection is induced which we call *phthisis pulmonalis*—consisting of symptoms attributable partly to the alimentary canal, and partly to the pulmonary organs.

One of the great difficulties in the pathology of phthisis as now brought forward, consists in the fact that whilst little fatty food enters the economy by the primary digestion, and the adipose tissue of the body disappears, fat is apt to be stored up in certain organs as the result of secondary deposition, especially in the liver. This fact, however, only proves that the formation of fat by the secondary digestion, and as a secre-

¹ A French critic, when noticing this statement, asked upon what proof it was founded. The proof, I thought, consisted in the frequent sour taste and acid eructations in phthisical cases. But since this question has been asked, I have seized every opportunity of testing the amount of acidity in the alimentary canal of persons dying from phthisis, and comparing it with what was observed in the bodies of those who died of other diseases. In this way, I have several times demonstrated, in the Pathological Theatre of the Infirmary, that there existed a marked difference in the amount of intestinal acidity, between the phthisical body and that affected with other lesions.

tion of certain organs, like the liver and female mamma, are excretory products, and as such are, *per se*, incapable of being reabsorbed or of affording nutrition. In short, such fat must undergo those changes and that elaboration which the digestive functions produce, before it can be made available for the formation of good blood, which, in its turn, is only a preliminary step to healthy nutrition. There is every reason however to believe that the various fatty compounds are convertible into one another,—that fat, for instance, introduced into the alimentary canal, or formed from the starchy and saccharine parts of the food, are, through elaboration, transformed into the fat of the liver, cholesterine, margarine, butter, etc., etc., in which condition they constitute products to be excreted. But that these, introduced into the alimentary canal, acted upon by the juices of its various glands, and further changed by the blood glands, may again be resolved into elements capable of nutrition. The true chemistry and effects of vital changes on the fatty compounds, however, have yet in a great measure to be worked out by micro-chemical research. In the meantime we may conclude with certainty—

1st. That an oily emulsion must be formed to constitute a proper chyle to be converted into blood.

2d. That in pulmonary and other forms of tuberculosis, this process is interfered with; so that,

3d. A depraved state of the constitution is induced, favourable to the deposition of tubercular exudation into various tissues, but especially into the pulmonary organs.

This theory has been objected to by Dr Glover of Newcastle, 1st, Because so far as his analyses go, the fats are not deficient in blood; 2d, Because tubercle itself often contains a considerable quantity of fat; and 3d, Because the theory “is altogether too mechanical, and vitiates itself by giving a too easy explanation of great difficulties.”¹

With regard to the amount of fats in the blood, it must undergo great variation, which, in respect to the process of digestion, has not yet been determined. The molecular basis

¹ On the Pathology and Treatment of Scrofula, pp. 115, 116.

of the chyle must pass in large quantity into the blood after each meal, where it may frequently be detected in the serum, constituting chylous or fatty blood. What becomes of this fatty matter diffused throughout the circulating fluid? Is it consumed in the lung, according to the view of Liebig? or does it go directly to constitute the adipose texture? It may be disposed of in both ways. The blood-globules, although for the most part soluble in acetic acid, have lately been determined by Dr Sanderson¹ to contain a certain amount of cholesterine; and Donné long ago showed that after all the globules had been separated from milk, and could not be detected by the microscope, that chemical analysis still exhibited the presence of fat in the residuum. It cannot be an objection to the views advanced, therefore, that because the small amount of fat found by the chemist in blood, has undergone no diminution, that therefore the fatty molecules introduced by the chyle have no connection with the nutritive and morphological changes in the economy.

As to the argument derived from the fact that tubercle itself is fatty, I have already disposed of it when drawing a distinction between oily molecules formed as a primary and evolving element, and similar ones formed as a secondary and disintegrating element. The source of fat in tubercle is evidently the albuminous compound which, like muscle, fibrinous exudation, and blood, may be transformed into oily granules by a chemical process not yet accurately determined. Flesh, by exposure to a running stream of water, is, as is well known, converted into adipocere. Here, again, the occurrence of such secondary fatty degenerations is in no way opposed to the theory which ascribes nutrition essentially to the emulsion formed in the villi and lacteals.

With regard to the notion that the theory is too mechanical and too easy, this, so far from being an objection in itself, would, were it correct, be a strong argument in its favour. The progress of physiology has in no way been more advanced than by encroaching upon the so-called vital and unknown

¹ Physiological Society's Report for May 14, 1853.

functions, and showing that several of them may be reduced to the well known laws of physics and chemistry. Unfortunately, however, those who conceive the molecular theory of organisation to be mechanical and easy, do not seem to understand it very thoroughly; for, granting the first form detectable by our microscopes to be molecular; that these molecules, by uniting into masses, constitute nuclei; that around these, cells are formed by the production of other molecules, and so on, how are we to explain the successive elaboration of solids and fluids without a knowledge of the influence of numerous organs and textures, and of the delicate chemical and physical alterations which are simultaneously proceeding in all of them at once? I am much afraid that if an "easy explanation of difficulties" be with some an insurmountable obstacle to the reception of a theory, that the one I have advanced ought not to be excluded on that ground. Indeed, its complexity is still so great, as to puzzle the thoughts of all the physiologists in Europe.

Still, I believe that on the basis of the molecular theory, physiology and pathology are destined to advance and give rise to a more perfect therapeutics. I consider the pathology of tuberculosis to be an instance in point. For although it is very probable some of the details of this theory may require modification, it will, I am firmly persuaded, be found to possess a general harmony with all known facts, while it suggests to the medical practitioner resources, the advantages of which continued experience is daily rendering more evident.

SECTION III.

Natural Progress of Tubercular Exudation—Its Tendency to Ulceration—Its Modes of Arrestment.

At first tubercle is deposited in a fluid state from the capillaries in the same manner that lymph is. In this condition it insinuates itself into the interstices of the pulmonary parenchyma, passes through the lining membrane of the air vesicles, and fills their interior. Numerous successful injections of pneumatic, tubercular, and cancerous lungs, in my possession,

demonstrate that the exudation in all is poured out in the same manner, and occupies the same position in the pulmonary texture. A miliary tubercle may, in this manner, block up from three to twenty of these air vesicles. It now coagulates and constitutes a foreign body, which can only be removed by being again broken down and rendered capable of being either absorbed or excreted. Thus the miliary or infiltrated forms, whether grey or yellow, after a time soften,—a process which may commence at any part of the mass and gradually affect the whole. This softening is a disintegration or slow death of the tubercular exudation, constituting true ulceration, which is more or less extensive according to the amount and superficial extent of the morbid deposit. When recent, the pulmonary parenchyma in the immediate neighbourhood is more or less congested; and when chronic, it is thickened and indurated, often forming a capsule which surrounds the tubercular deposit. The pleura also is very liable to be affected; when recently so, presenting soft fibrinous exudations with more or less adhesion; whereas when chronic, these become fibrous and reach a thickness and density seldom seen in other diseases. The bronchi are necessarily involved; their terminal extremities are among the first structures affected; and as the tuberculosis proceeds, all the appearances characteristic of chronic bronchitis are produced. As the ulcerative process extends, the lung is more and more destroyed, until at length it can no longer carry on its important functions, and the patient dies, or the fatal result, as very commonly happens, is hastened by disease in other organs.

The ulcerative or destructive tendency of the tubercular exudation has generally been supposed to be its chief characteristic; but there are very few cases in which its progress is uniform. It is continually checked, and for a time slumbers; and all morbid anatomists have recognised, even in the worst specimens of tubercular lungs, numerous cicatrices and evidences of attempts to heal. These attempts are more or less perfect, and when ineffectual, it is owing to the circumstance that as one portion of lung cicatrises, another becomes the seat of recent tubercle.

Cicatrices present different appearances, according as the cavities from which they were formed have been superficial or deep seated. In the first case it will generally be observed that the pleuræ are more or less adherent and thickened, and this frequently forms an external boundary to the tubercular cavity. As the matters which the cavity contains are expectorated or transformed, the lymph gradually contracts, draws the lung closely to the thoracic walls, from which it cannot be separated without great violence. Sometimes, however, it is deeper, and the adhesion is very slight or does not exist. In this case, when the walls of the cavern contract, the pleural surface of the lung is drawn inwards, and in this way the irregular puckerings visible on the surface are produced.

Occasionally no traces of tubercular matter are discovered either within or in the vicinity of these cicatrices. Under such circumstances they appear to be formed of dense fibrous tissue, and the parenchymatous substance in their vicinity is of a bluish-black colour, from increased pigmentary deposit, and of peculiar induration and density, owing to chronic exudation. More generally however, the contraction and puckering will be found to have occurred around tubercle which has undergone various transformations. Occasionally there are round masses of crude tubercle surrounded by a cyst. They are of unusual density, still of a yellowish colour; but contain granules of earthy salts more or less numerous. Often they are white and friable, resembling chalky matter. In this state the soft portions have been apparently absorbed, and the whole consists, under the microscope, of irregular masses of earthy matter, mixed with numerous granules and crystals of cholesterine. At other times the whole has been converted into a solid calcareous mass, frequently round, at others having numerous prolongations and irregularities, which accurately fit the surface and bronchi with which they are in contact. These cretaceous and calcareous concretions may remain an indefinite time in the parenchymatous substance of the lungs, or they may be evacuated through the bronchi with the sputa. The cyst which incloses them then forms a dense linear cicatrix.

Such appear to be the usual modes in which tubercular ulcers heal. They occur in exactly the same manner as abscesses in other parenchymatous tissues, the result of simple exudation; and that the process in both is identical, is proved by the frequency with which in the latter calcareous deposits also take place.

If, then, the further deposition of tubercle could be arrested, there seems no reason why cavities in the lung should not heal with the same frequency as ulcerations or abscesses in other internal organs. Indeed, the careful dissections of morbid anatomists have recently shown that this arrestment, instead of being a rare or occasional occurrence, really happens with extreme frequency.

In 1845, I made a series of observations with reference to the cretaceous masses and puckerings so frequently observed at the apices of the lungs in persons advanced in life. The conclusion arrived at was, that the spontaneous arrestment of tubercle in its early stage occurred in the proportion of from one-fourth to one-third of all the individuals who die after the age of forty. The observations of Rogée¹ and Boudet,² made at the Salpêtrière and Bicetre Hospitals, in Paris, amongst individuals generally above the age of seventy, showed the proportion in such persons to be respectively one-half and four-fifths.

The woodcut on the next page represents a characteristic specimen of these cretaceous and calcareous concretions in the apex of a lung, accompanied with puckerings and increased deposition of carbonaceous black pigment. It will be observed also that the pulmonary tissue, besides being indurated and contracted, is also somewhat emphysematous.

That such appearances are really evidences of arrested tubercles, is established by the following facts:—

1. A form of indurated and circumscribed tubercle is frequently met with, gritty to the feel, which, on being dried, closely resembles cretaceous concretions.

¹ Archives Générales de Médecine, vol. v. 1839.

² Comptes Rendus, tome 6^{me}. 1843.

2. These concretions are found exactly in the same situations as tubercle. Thus they are most common in the apex, and in both lungs. They frequently occur in the bronchial, mesenteric, and other lymphatic glands, and in the psoas muscle, or other textures which have been the seat of tubercular depositions or scrofulous abscesses.

3. When a lung is the seat of tubercular infiltration

Fig. 17.



Fig. 17. Section of the summit of the right lung in Elliot's case, p. 40, exhibiting the cretaceous masses, more or less loaded with and surrounded by carbonaceous deposit. Many air vesicles are enlarged, constituting incipient emphysema. The preparation now in my possession exhibits a characteristic specimen of the mode in which a considerable amount of tubercular exudation is arrested by calcareous degeneration. Natural size.

throughout, whilst recent tubercle occupies the inferior portion, and older tubercle, and perhaps caverns, the superior, the cretaceous and calcareous concretions will be found at the apex.

4. A comparison of the opposite lungs will frequently show, that whilst on one side there is firm encysted tubercle, partly transformed into cretaceous matter, on the other the transformation is perfect, and has occasionally even passed into a calcareous substance of stony hardness.

5. The seat of cicatrices admits of the same exceptions as

the seat of tubercles. In a few cases, I have found the puckering and cicatrix in the inferior lobe only; and have met with three where the inferior lobe was throughout densely infiltrated with tubercle, whilst the superior was only slightly affected.

It has indeed been argued, that occasionally these cretaceous masses may be the result of a simple exudation, or of what Dr Gairdner has called bronchial abscess in the lung. When they are found isolated in the middle or base of the organ, such certainly may be the case, and consequently the fifth argument may be affected. But this is rare, and can scarcely make any alteration in the vast proportion of those concretions and puckerings which are undoubtedly the result of abortive tubercles. With these facts before us, and with the knowledge that there is nothing in the nature of tubercle itself which is opposed to the arguments derived from anatomy, the frequent spontaneous arrest of this form of exudation may now be considered established.

Since these observations, however, have become known, it has been stated that after all, practically speaking, phthisis pulmonalis does not mean the existence of a few isolated tubercles scattered through the lung, and that what is really meant, is that advanced stage in which the lung is affected with ulceration, and in which the bodily powers are so lowered that perfect recovery seldom or never takes place. But here again, a careful examination of the records of medicine will show that many even of these advanced cases have recovered. Laennec, Andral, Cruveilhier, Kingston, Pressat, Rogée, Boudet, and others, have published cases where all the functional symptoms and physical signs of the disease, even in its most advanced stage, were present, and yet where the individual survived many years, ultimately died of some other disorder, and on dissection, cicatrices and concretions have been found in the lungs.

M. Louis, however, observes,¹ "I have not, in a single instance, discovered, in the midst of *healthy* pulmonary tissue,

¹ Sydenham Society's Translation, p. 24.

cavities communicating with the bronchi, and lined, like *old existing* tuberculous excavations, with a false membrane of slightly greyish colour, and opaque semi-cartilaginous appearance." Now, considering the large number of observations made by so distinguished a pathologist and physician, the inference to be derived from this statement, as well as from the whole tenor of his remarks on the cicatrisation of tubercular cavities, is that, without absolutely denying their rare occurrence, they are of little practical importance. It is a matter of very great moment, therefore, to show not only that tubercles may be arrested at an early period of their development, and when they are limited in extent, but that cavities of large size may be completely healed, and leave, even in the midst of healthy lung, unequivocal traces of their tubercular origin. On this point the following case must, I think, convince the most sceptical:—

CASE I.—*Advanced Phthisis; Restoration to Health; Death many years afterwards from Delirium Tremens; on Dissection, a Cicatrix, three inches long, in the Apex of Right Lung, and Cretaceous Concretions, with Puckering at the Summit of Left Lung.*

John Keith, æt. 50, a teacher of languages, was admitted into the Royal Infirmary, February 8, 1844, in a state of coma, and died an hour afterwards. On examination, the membranes of the brain, at the base, were unusually congested, and covered with a considerable exudation of recently coagulated lymph, here and there mingled with bloody extravasation. The apex of the right lung presented a remarkable cicatrix, consisting of dense white fibrous tissue, varying in breadth from one-fourth to three-fourths of an inch, and measuring about three inches in length (Fig. 18). The pleural surface in its neighbourhood was considerably puckered. On making a section through the lung, parallel with the external cicatrix, the substance immediately below presented linear indurations, of a black colour, together with five cretaceous concretions, varying in size from a pin's head to that of a large pea (Fig. 19). The surrounding pulmonary substance was healthy.

The apex of the left lung was also strongly puckered, and contained six or seven cretaceous concretions, each surrounded by a black, dense, fibrous cyst.

A very respectable-looking and intelligent man, who attended the post-mortem examination, informed me that Keith,

Fig. 18.



Fig. 18. External view of the summit of the right lung in Keith's case, p 37, representing the fibrous cicatrix. Natural size.

in early life, was in very indifferent circumstances, and had supported himself as a writer. At the age of two-and-twenty, or three-and-twenty, he laboured under all the symptoms of a deep decline, and his life was despaired of. About this time,

however, he was lost sight of by his friends; but it was afterwards ascertained that he had become a parish schoolmaster in the west of Scotland, and that his health had been re-established. He returned to Edinburgh six years before his death, and endeavoured to gain a livelihood by teaching Latin

Fig. 19.



Fig. 19. The section of the same portion of lung seen from within, the apex having been left entire to show the deep puckerings which covered its surface. The line of the healed cavity is densely loaded with black carbonaceous deposit, in which are seen five cretaceous concretions, three of them encysted. This preparation, now in my possession is, perhaps, a unique specimen, proving the healing by cicatrization, of an enormous tubercular excavation in the lung. Natural size.

and French. He succeeded but very imperfectly, and fell into dissipated habits. Latterly he had become subject to

attacks of mania, apparently the result of drink. It was after an unusually severe attack of this kind that he was brought into the Infirmary, where he died in the manner previously described.

This case points out the following important facts:—1st, That at the age of twenty-two or twenty-three the patient had a tubercular ulcer in the right lung, the size of which must have been very considerable when the contracted cicatrix alone was three inches long. 2d, That tubercular exudations existed in the apex of the left lung. It is, therefore, very probable that the statement made by his friend at the examination was correct—namely, that he laboured under all the symptoms of advanced phthisis pulmonalis. It is shown, 3dly, That, after receiving the appointment of a parish schoolmaster, after changing his residence and occupation, while his social condition was greatly improved, these symptoms disappeared. We may, consequently, infer that it was about this period that the excavation on the right side healed and cicatrised, while the tubercular exudations on the left side were converted into cretaceous masses, and so rendered abortive. It demonstrates, 4thly, That when, at a more advanced age, he again fell into bad circumstances, and even became a drunkard, tubercular exudations did not return, but that delirium tremens was induced, with simple exudation on the membranes of the brain, of which he died.

In the following case, not only did the examination of the body after death exhibit the anatomical changes which occur in chronic phthisis when undergoing a cure, but the previous history indicates how that cure was brought about by remedial means:—

CASE II.—*Advanced Phthisis; General Health Restored; Death eighteen months afterwards from Typhus Fever; on Dissection two Cavities in the Left Lung, contracted and healing; in the Right Lung Cretaceous Concretions, Puckering and Incipient Emphysema.*

Robert Elliot, æt. 28, was admitted into the clinical ward,

No. 2, of the Royal Infirmary, December 30, 1844. He had left the house two months previously, having then been under treatment four months, and taking cod-liver oil with marked benefit. On admission he was much emaciated, and there were all the symptoms of phthisis in its advanced stage. On percussion, there was dulness under both clavicles, but to a much greater extent on the left than on the right side. Under the left clavicle, and posteriorly above the scapula, there was loud gurgling râle, with imperfect pectoriloquy. On the right side, there was occasional sibilant râle; harshness of inspiratory, and prolongation of expiratory, murmur; with bronchophony. He took cod-liver oil readily; and was treated, in addition, with numerous remedies to meet occasional symptoms, more especially diarrhœa and hæmoptysis. He left the Infirmary, March 10, 1845, conceiving himself to be nearly well. His strength and general appearance had greatly improved, the physical signs on the right side were unaltered; but on the left, gurgling râles had been for some time absent, and been replaced by dry blowing sounds. Some months afterwards, he applied at the Royal Dispensary for some cod-liver oil, and was supplied with it regularly for a considerable time. He entered the Infirmary on two separate occasions subsequently, under different physicians, and was discharged in his own opinion well. In the summer of 1846, I was requested by one of the Dispensary pupils to visit one of his patients, affected with fever. It was this man Elliot, in a state of complete coma, and with the usual symptoms of typhus. I gave directions for conveying him to the Infirmary, but before this could be carried into effect he died.

Post-Mortem Examination.—Permission for the examination was obtained with great difficulty, and the chest only was examined. The pleuræ covering the apex of the right lung were very slightly adherent. The summit of the lung itself was deeply corrugated and puckered, and felt hard and nodule. On being bisected, it was found to contain numerous cretaceous masses, several of them enclosed within an indurated cyst of greyish fibrous matter. The surrounding lung

was condensed, puckered, and loaded with black pigment; and the spongy substance in the neighbourhood of the indurated portions presented numerous enlarged air-cells—in short, incipient emphysema. (See Fig. 17, p. 35). The left lung

Fig. 20.



Fig. 20. Internal section of the summit of left lung in Elliot's case, p. 40, showing the stellate puckering at the apex, and another lower down. Corresponding with the former may be seen a cavity the size of an almond, in process of contraction, and surrounded by dense fibrous radii. Natural size.

presented two distinct stellate puckerings—one at the summit of the lung, the other about two inches below. Both these puckerings corresponded to a distinct oval cavity. (Figs. 20 and 21.) They both possessed a distinct lining wall, and were surrounded by an indurated capsule, connected with radiating cicatrisations in the pulmonary tissue. In the upper one (see Fig. 20), this was very distinct.

Now, I think there can be little doubt that, if this man had lived longer, the cavities in the left lung would have con-

tracted still more, and produced either linear cicatrices, or remained as small permanent dilatations. That some tubercular ulcers of the lung, even when very extensive, may, by the evacuation or absorption of tubercles, be transformed into

Fig. 21.



Fig. 21. External section of the same portion of lung, showing another cavity also in the act of healing, in relation with the stellate puckering, lower down. This preparation, now in my possession, exhibits the intermediate stage of cicatrization in tubercular cavities, all the tubercle having been absorbed or expectorated, and the walls not yet collapsed. Natural size.

chronic cavities, with smooth lining membranes, the following case is a remarkable proof:—

CASE III.—Advanced Phthisis; General Health improved; Death in two years from a Fall, and Abscesses in the Kidneys; on Dissection, Left Lung contracted to the size of the Human Fist, and filled with Cavities having smooth membranes; no Tubercle; in the Summit of the Right Lung, Cretaceous Concretions.

John Finlay was admitted at the age of 19 into the clinical

ward of the Royal Infirmary, December 20, 1850. He had been troubled with cough, expectoration, and occasional diarrhoea for six years, and for three weeks he had been in the Surgical Hospital, under Mr Syme, with scrofulous caries of the left wrist joint. He had spat blood now and then, but to no great extent. On admission, his external appearance was pale, presenting all the so-called characters of the scrofulous diathesis. There was great emaciation, and development seemed to have been arrested, as he did not look above twelve years of age. The left wrist-joint was immoveable, considerably swollen, with several carious openings discharging pus. There was frequent cough, with copious muco-purulent expectoration. On percussion, the right chest was everywhere resonant; but there was marked dulness over the whole of the left chest, most complete in the subclavicular and suprascapular regions. On auscultation, loud mucous râles were heard over the whole of the left chest anteriorly, with gurgling and pectoriloquy under the clavicle. Posteriorly and inferiorly on this side, there was harsh tubular breathing, with prolongation of the expiration. There was puerile respiration on the right side, but otherwise nothing abnormal. Pulse 80; feeble. Tongue clean. Considerable nausea, and total loss of appetite. His diarrhoea had recently been checked by lead and opium pills. Careful management of the diet was ordered, with a tonic alkaline mixture, and small doses of cod-liver oil.

For the next three months, the loss of appetite, sickness, and vomiting, occurred at intervals, and the physical signs remained the same. From this period, however, his general health underwent gradual improvement, the cough was not so severe, and the expectoration became more mucous. The sweating greatly diminished, and he took food more readily. Towards the end of May, he had evidently gained much in flesh, and the discharge from the scrofulous sores in the wrist was trifling. The physical signs were so far altered that the mucous râles over greater part of left side were not so coarse or diffused, and the gurgling under the clavicle was now of a splashing character and more limited. Pectoriloquy in this situation was complete, and there was absence of expansion

during respiration. There could now also be heard harsh inspiration with prolonged expiration under the right clavicle; the resonance on percussion also was here slightly impaired. During June, he was much troubled with nausea and vomiting. On the 21st he was attacked with rigors, followed by all the symptoms of continued fever, which terminated by diaphoresis on the seventh day. Shortly after, he was attacked with variola, which ran its usual course. During July and August, there was gradual but marked improvement of his general health. At the end of the last-named month, the left wrist-joint was firmly ankylosed, and all the carious openings had closed up. He has had occasional diarrhœa. There was still dulness on left side, but the mucous râles were not heard so low down anteriorly. Fine crepitation, and increased vocal resonance, were now audible under the right clavicle. Up to the middle of October, he continued slowly to improve, the sweatings and diarrhœa had ceased, and the cough was much less severe. He now complained of considerable pain during micturition, and, on examining the urine, it was found to contain numerous pus-corpuscles, and to be coagulable by heat and nitric acid. He continued to feel pain on urinating, and to pass pus by the urethra during the month of October. On the 3d of November, the report is:—"Marked dulness on percussion over the left chest anteriorly, and under the clavicle cracked-pot sound. Posteriorly it is resonant. On auscultation, loud friction is heard from below up to the level of the nipple, and above this, loud mucous rattles passing into gurgling under the clavicle. Perfect pectoriloquy in this situation. On right side, puerile respiration; and posteriorly, sibilant râle at the termination of the inspiration. No sweating or diarrhœa. Still occasional nausea and vomiting. General strength much improved, and now walks about the ward, sitting up a great portion of the day." The report on the 21st of December is:—"Still marked dulness over the whole of left side, except under the clavicle, where it is tympanitic, with cracked-pot sounds. Resonance on right side good. Under acromial end of left clavicle feeble and distant gurgling is heard, the respiration having more of a blowing

character than formerly, with perfect pectoriloquy. The moist râles over the other parts of this side have disappeared. On right side, puerile respiration is heard over the inferior half of lung; otherwise, the breath-sounds are normal. Posteriorly, dulness of the whole of left side, but there is no cracked-pot sound. On auscultation, the signs are the same as are heard anteriorly. His general strength has much improved. Still complains of occasional nausea and vomiting, but, on the whole, takes his food well. Urine limpid, containing small shreds, which, on examination with the microscope, are seen to be composed of numerous pus-corpuscles embedded in mucus; slightly coagulable on the addition of heat and nitric acid. Pain on micturition diminished." From this time he continued, on the whole, to improve steadily, and was so well during the summer of 1852, as to walk about constantly in the open air, and went out of the house, by his own desire, on the 1st of the following August. About the middle of October, however, having been well in the interval, he fell down and injured his back. On the following day, he experienced rigors, followed by febrile symptoms, total loss of appetite, and hematuria. He was re-admitted November 1, when it was ascertained that considerable quantities of pus were passed with the urine, which, he says, had also been occasionally tinged with blood. There was pain on micturition, but none in the lumbar region. On examining the left lung, loud gurgling was heard both with inspiration and expiration, extending from the clavicle down to the upper margin of the third rib. There was great dulness on percussion. Below the clavicle, loud pectoriloquy, and lower down, œgophony. Under the right clavicle there was fine moist râle on inspiration, and increased vocal resonance, but the chest expanded well on this side, and was otherwise normal. The fever, prostration, and discharge of pus by urine continued without intermission, and he died December 4, 1852.

Sectio-Cadaveris, Dec. 6th.—Body greatly emaciated; the right carpal bones ankylosed, with marks of numerous old sinuses on the skin in their neighbourhood.

Chest.—Pleuræ on the right side adherent at the apex, by

loose bands of chronic lymph. The right lung indurated at the apex over an extent the size of a hen's egg, and strongly puckered externally. On section, this indurated portion was

Fig. 22.



Fig. 22. A drawing of the entire left lung of Finlay, of its natural size, bisected, and the two halves separated, as it may now be seen in the University Museum. The right half is exactly copied, showing the anfractuous cavities, lined with a smooth membrane, and the dense fibrous tissue between them. The left side is drawn in outline.

seen to contain several encysted cretaceous concretions, with the intervening pulmonary substance condensed, hard, and fibrous. A few chronic miliary tubercles were also scattered through

the upper lobe; but the rest of the lung was spongy, crepitant, and healthy. The pleuræ on the left side were everywhere firmly adherent, and over the superior half of the lung, which was much atrophied, they were converted into a dense white fibrous mass, three-fourths of an inch thick, which gradually diminished in thickness inferiorly. The left lung was not the volume of the closed fist; it was non-crepitant, felt indurated, but, at the same time, flaccid, evidently from internal cavities. On section the entire mass was riddled with cavities more or less communicating with each other, containing purulent matter, and having a smooth lining membrane. Many of them presented a pouch-like form, and were identical with what has been described as dilatations of the bronchi. At the apex were two encysted calcareous concretions, of the size of millet seeds, but there were no other traces of tubercular deposits. The fibrous structure between the cavities consisted of a close dense fibrous texture, of bluish colour, from pigmentary deposits, in which no remains of pulmonary structure could be found. The bronchi contained a considerable quantity of viscid, muco-purulent matter. Heart, larynx, and trachea, healthy.

Abdomen.—The large intestines, especially the cæcum, were congested, exhibiting here and there patches of slate-coloured pigment, with traces of cicatrised ulcerations, together with one superficial chronic erosion about half an inch in diameter, of irregular form. The kidneys were of natural size, and on section displayed dilatation of the pelves, with pouch-like enlargements, the result of scrofulous abscesses, filled with pus. The secreting substance was everywhere atrophied, and the tubular substance in many places obliterated. Mesenteric glands and other organs healthy.

A careful microscopic examination of the lining membrane of the pulmonary abscesses, exhibited nothing but fibrous tissue, destitute of epithelium. There was nowhere any trace of a mucous surface.

The treatment of this case was conducted on the principles, and according to the rules afterwards to be detailed. It was

directed principally to improve the appetite, diminish the nausea, vomiting, and diarrhoea, and support the strength by means of cod-liver oil and generous diet. Externally, repeated blisters were applied. During the attack of febricula and variola, antimonials were given in small doses. Latterly numerous remedies were administered to lessen the pains during micturition, such as anodynes, uva ursæ; bal. copaibæ; diuretics, etc.; but an enema of starch and solution of morphia succeeded better than anything else. It was always observed that in proportion as the dyspeptic symptoms were relieved, and the assimilation of cod-liver oil and food took place, so his health improved; and by great care he was not only kept alive for two years, but I had sanguine expectation of an ultimate recovery, when he met with the accident which, by exciting acute disease in the kidneys, caused his death.

I have detailed this case, however, principally with the view of pointing out another mode in which tubercular ulcerations of the lung are occasionally arrested, namely, by the formation of pouches or cavities, the lining membranes of which become smooth and cease to exude tubercle. This condition of the lung has been described by morbid anatomists under the name of dilated bronchi, and by Dr Corrigan, as cirrhosis of the lung.¹ In the first case, it has been imagined to result from chronic bronchitis, whereby the bronchi are dilated from within;² and in the second, from the formation of fibrous matters, the contraction of which causes this enlargement from without. A consideration of the details of this case, however, must convince every physician that we had here to do with large tubercular excavations, which, by compressing the lung, had obliterated the whole of its texture and converted it into a contracted fibrous envelope of these excavations. All trace of tubercular matter had disappeared, with the exception of two small cretaceous concretions, and the respiratory function was entirely carried on by means of the opposite lung, in which chronic tubercle to a limited extent,

¹ Dublin Medical Journal, vol. xiii. 1838.

² Laennec, vol. i. p. 201.

and very latent, was found. Whether, under such circumstances, the pulmonary lesion would ultimately have healed, it is difficult to say; but there can be no doubt he must have lived a long time in this condition before he met with the accident which caused his death. But that many such lesions may be arrested, and life continue, is proved by the observations of Reynaud, who has given figures of what he calls dilatations of the bronchi, many of which were evidently the result of tubercular ulceration.¹ Cruveilhier² has also figured a lung presenting similar appearances; and Dr. W. T. Gairdner³ has convinced himself that not only are these appearances the result of bronchitis, but of tubercular ulceration also.

In the case of another man, called Joseph Finnie, which closely resembled that of Finlay, I diagnosed, during life, the same contraction of the lung from tubercular excavations, and the same chronic dilatations in connection with the bronchi. This man died of Bright's disease in the Royal Infirmary, January 1853; and on dissection a similar state of the pulmonary texture was discovered, with the exception that the atrophy of the organ was not so great, whilst traces of tubercular infiltration were more evident.

What has been now stated, must, I think, show that the arrestment of tubercular ulceration may take place in three ways; 1st, By the gradual transformation of the exudation into cretaceous and calcareous concretions; 2d, By expectoration and absorption of the exudation, the collapse of the ulcerated walls, and formation of a cicatrix; 3d, By the ulcerated walls becoming covered with a smooth membrane, remaining open and constituting chronic cavities, which have occasionally been mistaken for dilated bronchi. It should not be overlooked that one or all of these modes of arrestment may be detected in the same lung, and that great diversities of appearance in the pulmonary texture may be thus occa-

¹ Mémoires de l'Académie Royale de Médecine, tome 4^{me}., Plate 4, Fig. 1; Plate 5, Fig. 1; Plate 7, Fig. 2.

² Anatomie Pathologique Livraison, 32, Plate 5, Fig. 3.

³ On the Pathological Anatomy of Bronchitis. Edinburgh, 1850. P. 77.

sioned. Moreover, the occurrence of black carbonaceous deposits is very apt to take place in the neighbourhood of the cretaceous concretions and cicatrices, thus communicating increased density to the texture. This density and contraction in the pulmonary tissue also is, as Dr Gairdner has shown, a cause of pulmonary emphysema in the air vesicles, a circumstance which has attracted the attention of many pathologists, and has even been considered to be essentially connected with the spontaneous cure of pulmonary caverns (Ramadge). This occasional result, however, is much to be dreaded, as it causes the dyspnœa not unfrequently observed to follow the removal of pulmonary tubercle. But the frequency with which all these various lesions are discovered, and their connection with the spontaneous cure of pulmonary tuberculosis, points out how much more commonly this lesion is arrested, than for a long period has been generally believed by the profession.

From the preceding facts and observations, therefore, we are warranted in drawing the conclusion, that if, during the advance of phthisis pulmonalis, those means can be discovered which check further tubercular exudation, and keep up the strength and nutritive processes of the economy, that such tubercular exudations as have occurred will be rendered abortive, and that even large ulcerations will heal up and cicatrise. The important point practically is to ascertain what these means are, and how they may be put into operation.

I have conversed with most of the distinguished physicians in this country and on the continent, and find that they are all enabled to refer to cases, which they are now satisfied have undergone a permanent recovery, even when cavities have existed in the lungs, and all the advanced symptoms of the disease have been present. I once made an effort to accumulate the experience of these distinguished men, on this point alone, and had I done so, it would have constituted an unanswerable amount of evidence as to the curability even of the worst cases of phthisis. Want of time, however, prevented them from writing down the facts. But it is unnecessary to refer to recorded experience, when the fact itself is established by the cases already given. Its comparative frequency, indeed,

might be illustrated by such an inquiry, and I believe this to be much greater than is generally supposed ; but to the great fact itself, nothing more can be added in the way of evidence than that presented by the remarkable cicatrix found in the lung of Keith. So deeply rooted, however, has been the opinion of the necessarily fatal nature of this disease, that the generality of practitioners have concluded, that *because* phthisical cases recovered, that the disease was *not* phthisis ; that is, they have rather distrusted their own diagnosis than ventured to oppose a dogma of general belief.

An observation of the circumstances which precede the disease, or its so-called causes, clearly indicate imperfect digestion and assimilation as its true origin. Thus phthisis is essentially a disorder of childhood and youth—that is, of a period of life when nutrition is directed to building up the tissues of the body. Diminish the proper quantity of food taken by a healthy man, tubercular diseases are not induced, but if this be attempted with children or young persons, they are a most common result. Thus scrofula and tubercle do not originate among the *able-bodied* men in armies and fleets, whatever privations they may be exposed to ; but they may be observed to do so in the young of foundling hospitals, factories, and the poor and labouring classes of the community, and especially among tailors, sempstresses, and others who follow sedentary employments. In the higher classes they result from imperfect and insufficient lactation during infancy, or the irregular diet caused by carelessness or over-indulgence. No doubt they may frequently be observed in persons whose parents or relatives have been similarly affected. From facts of this kind it has been supposed that hereditary predisposition, a vitiated atmosphere, changeable temperature, certain occupations, humidity, particular localities, absence of light, and so on, predispose to phthisis. Very frequently several of these are found united, so that it is difficult to ascertain the influence of each. When they so operate, however, they invariably produce, in the first place, more or less disorder of the nutritive functions, and are associated with dyspepsia, or other

signs of mal-assimilation of food. Cases analogous to the following are exceedingly common :—

CASE IV.—An Irish girl left her own country at the age of 17, to work as a field labourer in Scotland. In Ireland she lived on potatoes and sweet milk, and once a week had fish or a little meat. The quantity was abundant. In Scotland she lived on coarse oatmeal porridge and dry bread, with buttermilk, and did not taste fish or meat once a month. Under this diet her health gradually became affected, and she entered the Royal Infirmary at the age of 21, with all the symptoms and signs of advanced phthisis.

CASE V.—A lad, aged 16, of robust health, whose parents and relations were equally healthy, committed a theft. He was imprisoned in gaol for three months, confined in a damp stone cell, and lived on the ordinary prison fare. His health insensibly declined. On being liberated he could not obtain employment, and found that his strength had greatly diminished. Two months afterwards, he applied at the Royal Dispensary, labouring under phthisis pulmonalis in its advanced stage.

CASE VI.—A woman, aged 26, applied at the Royal Infirmary in 1843, who was greatly emaciated, and complained of harassing cough and expectoration. On examining the chest, perfect dulness existed under the right clavicle, with loud mucous râle, and imperfect pectoriloquy. The apex of the left lung was healthy. She had a son, aged six years, a perfect picture of health, and an infant at the breast, seven months old, also quite healthy. The mother died in 1844; both children are living, and are quite healthy, for the father, having good wages, was enabled to give them plenty of food.

CASE VII.—A young lady was induced to leave the country, and take charge of her brother's house in town. Deprived of her usual exercise and avocations, obliged to become a sharer in numerous anxieties, and go daily through a routine opposed

to her domestic and retiring disposition, her appetite became affected, she grew thin, and highly dyspeptic, and, in a few months, hacking cough and harsh inspiration, prolonged expiration and increased vocal resonance, with impaired resonance on percussion, were developed under one clavicle. She struggled on some time longer, but at length I recommended return to her former residence and occupations. From that moment the disease was arrested, and she may now be considered as restored to health.

It is unnecessary to multiply cases of this description. The more they are examined into, the more do I feel persuaded it will appear that the causes of phthisis are not hereditary influences, vitiated atmosphere, etc. etc., although *these may co-operate*, but almost invariably such circumstances as induce impoverished nutrition, resulting from an improper quantity, quality, or assimilation of food.

I cannot bring this chapter to a close, without alluding to the diagnosis of phthisis, and expressing my conviction that the general notion of its incurability is mainly attributable to the fact, that it is not recognised until it be far advanced. And yet there is, perhaps, no disease which, by one practised in auscultation, may be more readily detected. The harsh or tubular inspiration, the prolonged expiration, the increased vocal resonance, followed by dulness on percussion, together with the well-known general symptoms, can leave little doubt in the minds of the observant. True, there will always be instances so nicely balanced between health and disease, as well as pathological conditions so fine, that they do not furnish indications that will enable us to speak positively. Still, if practitioners only accustomed themselves to detect the signs above mentioned, phthisis would, in a great measure, be disarmed of its terrors. In short, it is not that medical art is destitute of means of detection, but that the necessary skill is not sufficiently diffused among medical practitioners; for, notwithstanding all that has been said and written on auscultation since the days of Laennec, it must be acknow-

ledged among ourselves, that comparatively few have sufficiently educated their ears to detect the finer thoracic murmurs.

The following are a few of the many instances which have come under my notice, illustrative of errors in diagnosis:—

CASE VIII.—An unmarried lady, æt. 25, quitted one of the northern Scottish cities, in 1842, to reside in Edinburgh. She had been harassed with distressing cough, dyspnœa, and weakness, for three years, and during that time had undergone all kinds of treatment, general and local, to combat a supposed phthisis pulmonalis. Knowing her family, and noticing her condition, I was confidentially informed by the friends that her case was hopeless, and that her medical advisers considered her lungs to be unalterably diseased. So strong was this opinion, that it was with some difficulty I persuaded the family to allow me to examine the chest. On doing so, I found the pulmonary organs quite healthy. On percussing over the sixth and seventh dorsal vertebræ, she screamed aloud, and jumped from her seat, as if she had received a shock of electricity. The case was one of spinal irritation and amenorrhœa, which yielded to counter-irritation and appropriate treatment. At the present moment she enjoys excellent health.

CASE IX.—A young lady, æt. 22, complained, in 1844-5, of great langour, weakness, irregular menstruation, and trifling cough. She applied to two surgeons, of great respectability in general practice, who happened to be attending another member of her family. The friends were informed that nothing was the matter but slight female derangement, and purgatives and emmenagogues were prescribed. In the autumn, she and her family visited a watering-place, and the practitioner there took the same view of the case, and continued the treatment. One morning she was discovered dead in bed; and, to the astonishment of all parties, both lungs were afterwards discovered filled with tubercles and anfractuous cavities.

CASE X.—I met a practitioner, some miles from town, in consultation on the case of a gentleman, who, I was informed, was labouring under acute pneumonia. In addition to the intense fever, I was told there was distinct crepitating râle over the whole of the right side, and that he had been actively treated by a large bleeding, purgatives, and tartar-emetic. On examining the patient, I found him in the last stage of phthisis, with loud mucous and gurgling râles in the upper half of the right side. He sunk rapidly.

CASE XI.—The daughter of a medical man became very slowly unwell—indeed, so slowly that the parents never noticed it. Three weeks before her death, Sir James Clarke was consulted, who detected caverns in the lung, not only to the great grief, but to the unbounded astonishment, of the father.

CASE XII.—A medical student hurried over from Paris, to attend the medical classes in this University, at the commencement of the session 1843-4. In crossing the Channel, he became very ill, and on arriving in Edinburgh, laboured under great febrile excitement. The case was considered one of fever, then very prevalent in the city, and treated accordingly. He died in a few days, and on dissection, the lungs were found to be filled with miliary and infiltrated tubercle. It was a case of acute tuberculosis.

CASE XIII.—A domestic female servant, whose sister was said to have died of phthisis, had been suffering from cough for two years, and had been treated during that time by various practitioners in vain, so that she herself was firmly convinced that she also was dying of consumption. On examining her chest, I could find no evidence of disease in the pulmonary organs, but in searching further for the cause of the cough, I found that the uvula was so long that its apex rested on the dorsum of the tongue. The uvula, at my request, was shortened by Mr Spence, and she has not coughed since, and her general health has become robust.

Cases of this kind could easily be multiplied. They appear to me capable of showing, that the fatality of phthisis pulmonalis is in a great measure owing to its insidious progress, to its reaching an advanced stage before it is detected, or to carelessness in medical examination, rather than to any peculiar virulence of the disease itself. Many diseases, undoubtedly curable in an early stage, if undiscovered and allowed to proceed unchecked, might be considered equally fatal. In this point of view, it has always appeared to me that our large charitable institutions are incapable of checking the evil. At our dispensaries, and among the out-cases of a large hospital, it is scarcely possible for the physician, on the stated days, to do justice to his patients. I have no hesitation in confessing that, on more than one occasion, I myself have been prevented from carefully examining patients, from sheer fatigue. The following is a common history of many applicants to these charities :—

CASE XIV.—A girl, æt. 19, applied to one of the Dispensaries, complaining of irregular menstruation, constipation, want of appetite, and various dyspeptic symptoms. She was ordered twelve purgative pills, and directed to take two every other night. Her chest was not examined. Three months afterwards, she again applied, with hacking dry cough. She was ordered an anodyne and squill mixture, which increased the nausea and dyspeptic symptoms; but she had her bottle filled regularly for two months. Diarrhœa now came on, which greatly reduced her; and, on applying for the third time at the Dispensary, it was *now* seen that she was consumptive. The disease ran a very rapid progress, and she died in the Royal Infirmary.

Now this, I believe, is the case of thousands of persons who perish from consumption; and I feel satisfied that, had the diagnosis of the disease been properly established at an early period, its onward march might have been arrested. Phthisis, in its incipient stage, may be considered a very curable disease; indeed, so much so, that cure is, as we have seen, spon-

taneously accomplished by nature, in a vast number of cases. So long as misery and poverty exist on the one hand, and dissipation and enervating luxuries on the other, so long will the causes be in operation which induce this terrible disease. But the means of checking and controlling it on a large scale must be sought, not in drugs, but in hygienic conditions, and the diffusion among medical men of that knowledge and skill requisite for detecting the existence of the disease in its early stages. In short, one of the most efficacious remedies consists in those practical instructions of the medical student at the bed-side, which are now systematically carried on in the clinical wards of this and some other schools of medicine.

In conclusion, let no one undervalue percussion and auscultation. And I say this, because I feel satisfied that, notwithstanding every body now-a-days carries about a stethoscope, there are few who derive from it all the advantages it is capable of bestowing. I would take the liberty of recommending to certain writers, in their popular expositions of medicine, in future to avoid sarcasms which are only calculated to excuse indolence in students, and to depreciate the value of the scientific investigation of disease among practitioners. What advantage, for instance, can medicine derive from publishing the following passage:—"We wonder how many of the century of graduates sent forth from our University every year, armed with microscope, stethoscope, uroscope, pleximeter, etc., and omniscient of *râles* and *rhonchi*, sibilous and sonorous; crepitations, moist and dry; *bruits de râpe, de scie, et de soufflet*; blood plasmata, cytoblasts, and nucleated cells, and great in the infinitely little—we wonder how many of these eager and accomplished youths could 'unsphere the spirit of Plato,' or read with moderate relish and understanding one of the Tusculan dissertations, or who had ever heard of 'Butler's Three Sermons on Human Nature,' 'Berkeley's Minute Philosopher,' or of an 'Essay on the Conduct of the Understanding.'"¹ On this subject, I am of opinion that, if our university graduates can detect the *râles* above alluded

¹ North British Review, November 1849.

to, and know their diagnostic value, it must be a matter of comparative indifference to mankind whether they are able to "unsphere the spirit of Plato," or not. It is, certainly, a good thing to possess the sagacity and practical tact of a Sydenham or an Abercrombie; but it is better still to have, *in addition* to this, the practised ears and pathological knowledge of a Laennec or a Louis.

CHAPTER II.

GENERAL TREATMENT OF PULMONARY TUBERCULOSIS.

FROM a study of the symptoms, causes, morbid anatomy, and histology of pulmonary tuberculosis, we have been led to the conclusion, that it is a disease of the primary digestion, causing—1st, Impoverishment of the blood; 2d, Exudations into the lung, which present the characters of tubercular exudation; and 3d, Owing to the successive formation and softening of these, and the ulcerations which follow in the pulmonary or other tissues, the destructive results which distinguish them. It has also been shown, that circumstances which remove the mal-assimilation of food frequently check the tendency to repeated tubercular exudations, while those which previously existed become abortive, and that occasionally extensive excavations in the pulmonary tissue may, owing to like circumstances, heal up and cicatrise.

But although the fact of the recovery from phthisis pulmonalis, even in its most advanced stage, can no longer be denied, it has been argued that this is entirely owing to the operations of nature, and that the physician can lay little claim to the result. Andral, who early admitted the occasional cicatrisation of caverns, states this in the following words:—“No fact, he says, demonstrates that phthisis has been ever cured, for it is not art which operates in the cicatrisation of caverns; it can only favour this, at most, by not opposing the operations of nature. For ages remedies have been sought either to combat the disposition to tubercles or to destroy

them when formed, and thus innumerable specifics have been employed and abandoned in turn, and chosen from every class of medicaments." But if it be true, according to Hoffman, that "*Medicus naturæ minister non magister est*," it follows that by carefully observing the operations of nature, learning her method of cure, imitating it as closely as possible, avoiding what she points out to be injurious, and furnishing what she evidently requires, that we may at length arrive at rational indications of treatment. In short, a correct interpretation of the processes gone through during a spontaneous arrestment of the disease, must be the foundation for those principles which should regulate the interference of art.

Now, a careful examination of phthisical cases will, I think, show that the great obstacle the practitioner has to contend with are the dyspeptic symptoms, which render all his efforts at nourishing the patient in the ordinary way useless. Such individuals have a most capricious appetite, frequently loathe all kinds of animal food, and it will be found that even when they *say* that the appetite is good, and that they live well, the diet actually consumed is either deficient in quantity or in quality. Nothing, again, is more common in the progress of such cases than the temporary improvements which follow a change of diet, of locality, or of temperature. How frequently do poor patients, on coming into an hospital, get better merely from enjoying rest and the regular diet of the institution. How often, after a short journey, or on reaching what has been considered a favourable locality, are the friends of consumptive patients in the higher classes rendered happy by the temporary marked improvement which takes place. I consider that such amendments will always be found commensurate to the stimulus given to the nutritive processes of the economy.

From the foregoing considerations it follows that the cure of pulmonary tuberculosis by art, will be proportionate to our power, 1st, Of improving the faulty nutrition which is the cause of the exudation assuming a tubercular character; 2d, Of favouring absorption of the exudation already poured out; and 3d, Of preventing the recurrence of fresh exudations by

careful attention to hygienic regulations. I propose making some observations on each of these heads, as preliminary to the special treatment of individual cases.

First Indication—To improve the Faulty Nutrition, which is the Cause of the Exudation assuming a Tubercular Character.

To improve the faulty nutrition which originates and keeps up the disease, it is of all things important to cause a larger quantity of fatty matter to be assimilated. A mere increase in the amount, or even quality, of the food, will often accomplish this, as in the case of Keith (Case I. p. 37). But in order that animal diet should be digested and assimilated, the powers of the stomach and alimentary canal must not have undergone any great diminution. In most cases it will be found that the patient is unable to tolerate such kind of food, and that it either lies undigested in the stomach, or is sooner or later vomited. Under these circumstances fluid fatty matters themselves are directly indicated, by giving which we save the digestive apparatus as it were, the trouble of manufacturing or separating them from the food. By taking a considerable quantity of oil, a large proportion of it is at once assimilated, and is rendered capable of entering into combination with the albumen, and thereby forming those elementary molecules so necessary for the formation of a healthy chyle. Such, it appears to me, is the rationalé of the good effects of cod-liver oil.

Since I introduced cod-liver oil to the notice of the profession in this country, as a remedy for phthisis, in 1841, I have continually prescribed it in hospital, dispensary, and private practice. I need not perhaps say, that I have given it in a very large number of cases, and have observed its effects in all the stages of the disease, and under almost every circumstance of age, sex, and condition. I have had the most extensive opportunities of examining the bodies of those who have died after taking it in considerable quantities, and am still observing the cases of many persons who may be said to have owed their lives to its employment. Further, I have carefully watched the progress it has made in the good

opinion of the professional public, and perused all that has been published regarding it in the literature of this and other countries. It were certainly easy for me, therefore, to write at great length on this subject; but it appears to me unnecessary to dwell on the utility of a remedy which the experience of the last twelve years in Scotland, and twenty years in Germany, has rendered so obvious. It need only be said with regard to cod-liver oil, that although at first many eminent practitioners have felt more or less sceptical as to its value, and have therefore delayed giving it, I have not heard of one who, after employing it in a few cases, has retained any doubt as to its importance in scrofulous and consumptive cases.

The general opinion of the profession, with regard to cod-liver oil, may be said to have fully confirmed what I formerly stated concerning it in the following words, viz., "That no remedy has so rapidly restored the exhausted powers of the patient, improved the nutritive functions generally, stopped or diminished the emaciation, checked the perspiration, quieted the cough and expectoration, and produced a most favourable influence on the local disease. Many individuals presenting the emaciation, profuse sweats, constant cough and expectoration, as most prominent symptoms, with a degree of weakness that prevents their standing alone, after a few weeks' use of it, are enabled to get up with ease and walk about, with a visible improvement in their general health, and an increased amount of flesh. The physical signs of the disease may continue unaffected for some time, but if the treatment be continued, the moist gurgling rattles are exchanged for dry blowing sounds, which become more and more persistent, pectoriloquy is merged into bronchophony, the respiration is easier, and a check is evidently given to the ulcerative process, and the formation of purulent matter in the air passages."¹

The following is a summary of my views regarding cod-liver oil, as a remedy for pulmonary tuberculosis:—

1. Cod-liver oil is, as M. Taufflieb pointed out, an *analeptic*

¹ Appendix to Treatise on the Oleum Jecoris Aselli, p. 189.

(*αναλαμβάνω*, to repair), and is indicated in all cases of deranged nutrition dependent on want of assimilation of fatty matter.

2. It is readily digestible under circumstances where no other kind of animal food can be taken in sufficient quantity to furnish the tissues with a proper amount of fatty material.

3. It operates by combining with the excess of albuminous constituents of the chyme, and forming in the villi and terminal lacteals those elementary molecules of which the chyle is originally composed.

4. Its effects in phthisis are, to nourish the body, which increases in bulk and in vigour; to check fresh exudations of tubercular matter; and to diminish the cough, expectoration, and perspiration.

5. The common dose for an adult is a table-spoonful three times a-day, which may often be increased to four, or even six, with advantage. When the stomach is irritable, however, the dose to commence with should be a tea or dessert-spoonful.

6. The kind of oil is of little importance therapeutically. The pure kinds are most agreeable to the palate; but the brown coarser kinds have long been used with advantage, and may still be employed with confidence whenever cheapness is an object.

7. I have never observed its employment to induce pneumonia, or fatty disease of the liver or kidney, however long continued, although such complications of phthisis are exceedingly frequent.

It has been argued, that if it be merely the assimilation of fatty matter which is required to improve the faulty nutrition in tuberculosis, any kind of oil would answer the purpose. Now, as I have previously stated, whenever fat in any form, or food rich in fat, can be digested, benefit is sure to follow; and hence, in certain cases, the well known good effects which have been obtained from the use of milk, especially asses' milk. Cream and butter have also been given largely. Ascherson has recommended caviar, and Popken fat bacon, with partial success. I have seen mutton and pork chops do wonders, but then the appetite and stomachic functions have been far better than is

usually to be found among phthisical cases. I have also been informed that, in some parts of America, cures have been brought about by living on the bone marrow of the buffalo, and that the consumptive patient gets so strong in this way, that he is at length able to hunt down the animal on the prairies. Again, vegetable oils have been tried, but the purest of them, such as the almond and olive, produce, in the majority of cases, a purgative action, and thereby diminish instead of improving the strength. Linseed oil has been largely tried by Rust and others, who have given it in mistake for cod-liver oil, and found it to be of little service. On the whole, therefore, although the occasional success of various kinds of fatty matters and of fatty food, when assimilated, confirms the general principle which, under the head of pathology, I have endeavoured to establish, the universal result of experience is, that no substance hitherto known is so easily tolerated by the stomach, and is of such general application as an analeptic in tubercular diseases, as cod-liver oil.

But even this substance, in a few rare cases, cannot be retained on the stomach, and efforts have been made to introduce fat into the economy by some other channel, such as by the skin or rectum. Frictions with oil and unguents were largely employed by the ancients, and constituted part of the system of training their *athletæ*. More recent observations have shown that butchers, cooks, oil-men, tallow-chandlers, tanners, and other individuals who are continually coming in contact with fatty matter, are for the most part particularly robust and well nourished, and are less liable than others to tubercular disease. Dr Simpson¹ has lately noticed, that the children and young persons employed in wool factories, where large quantities of oil are daily used, are generally exempt from scrofula and from pulmonary consumption. This renders it probable that a certain amount of fat may, by entering the lymphatics of the skin, so affect the chyle as to render it more nutritive; and that, in cases where oil cannot, without great difficulty, be tolerated by the stomach, advantage may be de-

¹ Monthly Journal, April 1853.

rived from introducing it through the integument. Such a practice, indeed, has been recommended by Dr Baur of Tübingen,¹ who has given several instances where the scrofulous disposition has been removed by rubbing in different kinds of oil. I have adopted this plan in a few cases, but having rarely met with patients who could not be induced to take the oil internally, under proper management, my experience of its effects, administered by the skin, has been very limited. Some time ago, I caused a cod-liver oil ointment, manufactured by the Messrs Parker of Leith Walk, to be used externally; but, unfortunately, the constant smell proved to be more disagreeable than the unpleasant taste and eructations. Even the purest vegetable oils, used externally, cause great trouble in applying them, stain the linen and dress, occasion in some, unpleasant sensations of uncleanness, and, to the poor, are very costly. Still, if oil be assimilated, however administered, it must, according to the principles I am contending for, be beneficial; and as the practice of inunction is now being very extensively tried, we shall soon have more exact means of judging of its value.

In a letter which I received from Dr Buist of Aberdeen, on the 23d of last June, he informs me that he was induced, by the consideration that the rectum was a more reasonable channel than the skin for introducing nourishment, to try oleaginous enemata. These were composed of a couple of wine-glassfuls of cod-liver oil, a table-spoonful of wine, the same quantity of arrow root, beat up with eight or ten ounces of warm water, to which was added sixty drops of laudanum. I have since tried this mode of administering oil, and in a few cases with temporary advantage. I fear, however, that the objection to the constant use of enemata will, by the majority of persons in this country, be stronger than that against continued inunction. In cases, where the stomach is obstinately intolerant of food, one or both modes of introducing oil should be tried, with a view of re-animating the vital powers and of gaining time. But after

¹ Archiv. für die gesammte Medicin. von Haser. Bd. 1. s. 256; and the Author's Treatise on Cod-Liver Oil, p. 56.

all, it must be evident that as nature never intended mankind to be permanently nourished either by the skin or by the rectum, so, in imitation of her processes, the object of an analeptic treatment in pulmonary tuberculosis, must be to cause the elements of food to be taken by the mouth; to diminish the dyspeptic symptoms, and induce assimilation by the lacteal rather than by the lymphatic vessels.

Second Indication—To favour Absorption of the Exudation already poured out, and subdue the Symptomatic Fever produced.

We have seen that the changes which occur in the blood-vessels and their contained blood, preliminary to a local tubercular exudation, are of exactly the same character as when a simple or inflammatory exudation occurs, and that the difference between the two consists in the diminished power of growth possessed by the former. The symptoms which accompany the actual period of exudation vary in intensity according to its amount, extent, and the rapidity with which the local changes occur. In their nature, however, they are exactly the same as characterise the various so-called inflammatory diseases of the lungs, such as pneumonia, bronchitis, and pleuritis. Indeed, these lesions are the constant accompaniments of pulmonary tuberculosis, and occur more or less rapidly—that is, they are acute or chronic. Hence all kinds of intermediate changes between the simple and tubercular exudations are constantly going on in the progress of a case, and the phenomena of phthisis, pneumonia, pleurisy, and bronchitis, in their acute or chronic forms, may appear together, and be inextricably mingled, or they may succeed each other at intervals. This circumstance, which is so puzzling to the inexperienced practitioner, and often leads to such errors in diagnosis and treatment, affords to the pathologist who can detect them by auscultation, the most accurate information as to the progress of the disease, and the character of the remedies he should employ.

Pulmonary tuberculosis is undoubtedly, for the most part, a slow and insidious complaint, but the careful observer will

not fail to remark, that it is scarcely ever free from exacerbations, characterised either by their febrile character, or by increased cough and local pain. These are only too frequently attributed to "attacks of cold" by the patient, and their nature is not even guessed at, unless a careful diagnosis has been made by a physician. But when phthisis has been recognised, these febrile attacks and so-called "colds" resolve themselves either into the occurrence of a repetition of the tubercular exudations, or into intercurrent pneumonia, pleurisy, or bronchitis. In some cases, indeed, these attacks are scarcely perceptible, and the disease runs a slow and insidious course throughout; in others, they are frequent, and occasionally so violent and severe that the individual dies rapidly, constituting a so-called "galloping consumption." Between these two extremes there is every kind of gradation, which defy description, but which will be readily understood by the pathologist. Consequently, the great problem to be worked out in the treatment of pulmonary tuberculosis, is that, while on the one hand it is originally a disease of diminished nutrition and weakness, and consequently requires a general invigorating and supporting system of treatment, that on the other, it is accompanied by local excitement, which demands an antiphlogistic and lowering practice. These two opposite indications have created the greatest confusion in the minds of practitioners, and hence the long disputes about the phlogistic and antiphlogistic nature of phthisis, whether it be inflammatory or non-inflammatory, whether it should be treated by bleeding and tartar emetic, or by tonics and good diet.

Although the general notion of those who have maintained the inflammatory origin of tubercle is pathologically correct, in so far as it depends upon an exudation of the liquor sanguinis, the practice founded upon this doctrine has led to the most unfortunate results. Experience in recent times has demonstrated that even uncomplicated cases of pneumonia, where hepatization is well marked, so far from being benefited by bleeding and antiphlogistics, will frequently recover sooner and better under an opposite line of treatment. This fact, indeed, is now universally acknowledged, and although some

endeavour to explain the present revolution in practice, by supposing that the disease has undergone a change in its type, it seems to me more probable that it is not because an inflammation is different now to what it was thirty years ago, so much as to an improved diagnosis and pathology, that we must ascribe the alteration. But if it has been shown that pure and uncomplicated pneumonia, in healthy constitutions, is frequently injured by bleeding, how much more should we avoid this practice in cases where weakness and defective nutrition are the essential characters of the disease.

When an exudation is poured into the pulmonary air vesicles and bronchi, the rapidity of its resolution will depend upon its extent, constitution, and the general vital power of the individual. Should it remain fluid for any time, it may re-pass into the vessels without further change, and there is every reason to suppose that a bleeding at this moment, that is, before it has solidified, and when commencing crepitation is heard, may, by impoverishing the general mass of blood, favour this result. But in the great majority of cases it coagulates; and histological observation has shown that its subsequent absorption is dependent on its being transformed into cells, which are more perfect and more rapidly developed and disintegrated, and consequently sooner got rid of, according as the vital powers and state of nutrition of the individual are more perfect. On the other hand, whatever lessens the general strength of the system, checks this cell development in the coagulated exudation, and delays the transformation through which it must pass before it can be absorbed. Hence the great effort of the practitioner, so far from diminishing the strength, ought to be to support it, and favour cell growth and disintegration:—then, when the blood is loaded with the effete matter thus introduced into it, to assist its excretion by means of diaphoretics, diuretics, and purgatives, according to circumstances.

Hitherto bleeding in pneumonia has been made dependent, not so much on the pathological state of the lung, as upon the general condition of the patient, and upon the force of the pulse. It has been supposed that, by abstracting a consider-

able quantity of blood from the system, we act upon the vessels of the inflamed part, and prevent the extension of the disease. But venesection can only lessen the amount of blood in any internal organ, by operating on the system generally, and diminishing the force of the heart. In doing so, however, we weaken the powers of the economy, and this at a time when the febrile symptoms prevent nourishment from being introduced by the alimentary canal. But it has always appeared to me, that when hepatization has occurred to any extent, our chief object should be, not to attempt lessening the blood in the inflamed part, the possibility of which, by means of a general bleeding, is very doubtful; not to diminish the congestion of the neighbouring parts, under the idea of preventing an extension of the disease,—but to relieve the affected organ of the coagulated exudation which is pressing upon the vessels, impeding the circulation and obstructing the entrance of air. Indeed, it must be clear that this latter is the essential process to be favoured, and all known facts prove that a check to the vital powers of the economy is directly opposed to its accomplishment.

Such are the views which, for some time, have regulated my practice in pulmonary lesions, and they appear to me capable of accounting pathologically for the good results of that remarkable change in practice which has lately taken place with regard to bleeding in these diseases. If they be sound with regard to a simple pneumonia, I need not say that they apply with increased force to cases labouring under an essentially debilitating disorder like pulmonary tuberculosis. Accordingly, universal experience has lately demonstrated that, in the last-named disease, not only are a good diet, cod-liver oil, and abstinence from lowering remedies, the best means for correcting the general nutrition, but that they also secure the most rapid disappearance of the exudation; convert the moist rattles of the lung into dry sounds; favour the contraction of cavities, and convert such tubercles as have not softened into cretaceous matters, by inducing absorption of their animal matter.

What has tended, perhaps, more than anything else, to

favour moderate general bleedings in acute phthisis, as well as local bleedings during the exacerbations in the course of chronic phthisis, is the temporary relief they occasion. I consider that there is no fact better established in practical medicine than that a considerable amount of relief, consisting of less local pain, a more free respiration, and diminished febrile action, may frequently be seen to follow the use of moderate, general, or local bleeding. Indeed, the benefit is sometimes so marked as to induce their frequent repetition. But every one of the cases I have seen so treated have terminated fatally. On the other hand, by carefully avoiding depletion; husbanding the patient's resources during the exacerbations and fever; simply favouring excretion by means of antimonials; then, on their subsidence, once again cautiously administering nutritives, and following the first indication, I have succeeded, as the cases subsequently detailed will prove, in causing a permanent arrestment of the disease, and ultimately a complete cure.

The plan, therefore, which is best adapted for checking the local changes producing acute exudation, and for subduing the symptomatic fever, ought to be much the same as guides us in the treatment of a typhus fever. In this disease the administration of active lowering remedies at first, is well known to increase the subsequent collapse, and retard convalescence,—so in pulmonary tuberculosis, however we may flatter ourselves that by bleeding or mercury we have checked inflammation, the real disease, so far from being arrested by these remedies, is, for the most part, accelerated. For some years, therefore, I have depended solely on small doses of antimony, with occasional diuretics, to relieve the acute symptoms, exacerbations, and febrile excitement, and have never had occasion to repent the practice.

In the chronic forms of the disease, the second indication is only to be followed out by topical counter-irritation. Hence a seton, or issue, a succession of blisters, tartar emetic ointment, and croton oil, are all beneficial, and may be used according to circumstances. Cold sponging, employed with great precaution, so as not to produce a chill, but rather a

glow of heat afterwards, is also beneficial. The application of leeches should be avoided, as it is not easy to see how abstracting a few ounces of blood from the thoracic integuments, which are furnished with blood from the mammary and intercostal arteries, can operate upon such vascular organs as the lungs, receiving their blood entirely from the pulmonary and bronchial arteries.¹ It is true that a few leeches applied under the clavicle often relieve certain symptoms; but I have never been able to satisfy myself that they have ever been of permanent benefit; and although I am far from saying that they are always injurious, I have occasionally thought that the exposure of the person, the warm fomentations, and unpleasant trickling of blood, have increased rather than diminished the uneasiness of the patient.

Third Indication—To prevent the recurrence of fresh Exudations by careful attention to Hygienic regulations.

If we can succeed in renovating the nutritive processes, arresting the disease, and favouring absorption of the exudation already poured out, it becomes very important to prevent the recurrence of fresh exudations. This is only to be accomplished by avoiding all those circumstances likely to deteriorate the constitution on the one hand, or induce pulmonary congestion on the other, and offers a wide field for the judicious practitioner, especially in his character of a watchful guardian of the patient's health. One of the great difficulties we have to overcome in this climate, is the frequent variations of temperature, and the sudden changes from fervent heat to chilling cold. Supposing that we have the means of supporting nutrition and arresting local irritation, it is by no means certain that good will be accomplished, from the impossibility of securing those hygienic regulations and that equable climate, which are necessary to carry out the third indication. In the first place, nutrition itself is more connected with proper exercise and breathing fresh air than many people imagine. It

¹ On this point I would refer to some very able remarks by Mr John Struthers, on "Local Blood-letting in Affections of the Internal Viscera." Monthly Journal for April 1853.

does not merely consist in stimulating the appetite and giving good things to eat. It requires,—1st, Food in proper quantity and quality—2d, Proper digestion—3d, Healthy formation of blood—4th, A certain exchange between the blood and the external air on the one hand, and between the blood and the tissues on the other—and 5th, It requires that there should be proper excretion, that is, separation of what has performed its allotted function and become useless. *All* these processes are necessary for nutrition, and not one or more of them, for they are all essentially connected with, and dependent on one another. The means of preventing not only pulmonary tuberculosis, but tuberculosis in general, therefore, consist in carrying out those hygienic regulations which secure these different nutritive acts. The most important of these undoubtedly are attention to climate, exercise, and diet.

Much has been written on climate, and more especially on the sanative influence of certain foreign climates in cases of consumption, and nothing is more difficult than for a medical man, practising at home, to arrive at correct notions on this subject. He may read books on climate generally; he may study monographs on the special advantages of particular places, and he may further converse with sensible men who have practised there, without being in any degree more enlightened. As a general rule, every local practitioner speaks highly of the superior merits of his own place of residence. He is ready to give you a list of the most extraordinary recoveries. He instances the cases of Lord this and Lady that, who, on their arrival, were in the worst possible condition, and who, during their sojourn in his locality, even surprised *him* by their rapid recovery. In short, when listening to these accounts, we feel astonished that any case of phthisis should die, did not all such practitioners, in reply to a straightforward question, acknowledge that deaths, notwithstanding, were very common, and that, after all, these remarkable cases were the exception and not the rule.

The real questions to be answered, in reference to the sanative influence of climate, are,—1st, What is the proportion of cases in which arrest of the disease takes place, as determined by a strict

diagnosis, the stage of the disorder, and the age and general strength of the patient? 2d, Are such arrests more frequent in foreign countries than they are at home? So far as I am aware, no series of facts exist capable of satisfying us on these points. On the other hand, is it not certain that if a phthisical person recovered his bodily strength in Madeira, Spain, or Italy, the benefit is at once ascribed to the influence of climate; whereas, if the same thing happens at home, the case is considered one of bronchitis, or at all events its phthisical character is denied? Yet it has of late become sufficiently evident, that, with proper care and treatment, phthisis may be arrested in this country much more frequently than was formerly supposed; and we have no reason to believe that such arrestment is more common in Madeira, Egypt, or Italy, than it is in Edinburgh or London.

It may then, fairly be asked,—Whether the practice which has so long prevailed, of sending consumptive patients abroad is beneficial or not? My own experience is on the whole hostile to the propriety of sending confirmed phthisical patients abroad in search of health. I have now met with many consumptive individuals who, so long as they remained at home, continued in a satisfactory condition, enjoyed life, and carried on their usual occupations in comfort; but who, seized with an unconquerable desire of completely getting well, through the agency of a warm climate, have gone to Italy, Malta, or other favoured locality, and died most miserably. Such cases have been so frequent as to have given rise in my mind to a feeling of great scepticism as to the utility of expatriating such persons,—a feeling which would have become absolute, were it not counterbalanced by a conviction engendered by foreign travel, and dependent on what may be called personal sensation, rather than actual experience of any beneficial result obtained by others. I allude to that exhilarating feeling which the traveller experiences in the south of France, or the borders of the Mediterranean, caused by the clear atmosphere, balmy air, and luxuriant landscape. He who has felt that delightful sensation, and paid attention to its influence on his own bodily powers, will not easily abandon the idea that such influence,

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 htly directed to the relief of certain morbid conditions,
 have some effect. I believe that such a feeling insen-
 constitutes the real basis of all our belief concerning the
 effects of climate; and as, notwithstanding repeated
 appointments, I cannot help thinking that, in certain cases,
 really beneficial, it may be worth while to enquire why it
 en fails, and why it sometimes succeeds.

Supposing, then, that residence or travel in certain foreign
 countries, may be beneficial in particular cases, and the chief
 argument in its favour are the sensations to which I have
 alluded, it cannot be denied that many fallacies are liable to
 enter into our reasonings. For instance, it does not follow
 that the same elastic feeling experienced by a healthy, vigorous
 individual on the mountain side, on the sea-shore, or in the
 beautiful valley, should be felt by a debilitated, worn-out
 person in a similar situation. Nor is it reasonable to suppose
 that the qualities of mind, power of exertion, and consciousness
 of bodily strength—all of which are elements in the production
 of the feeling alluded to—should be alike in the two cases.
 Hence, while some persons may be benefited, and the nutri-
 tive powers stimulated under such circumstances, others will
 feel languor, depression of spirits, or increased fatigue, and
 find themselves much worse. The difficulty, therefore, is to
 discriminate between these two classes of persons,—a difficulty
 which defies all general rules, dependent as it is not only on
 the stage of the disease and bodily strength of the individual
 at the time, but also on his peculiar constitution, habits,
 general excitability, powers of imagination, and cultivation of
 mind. Hence, before sending patients abroad, all these points
 must be anxiously considered; and even then, the whole will
 resolve itself into the fact, which can only be determined by
 experiment, whether upon actual trial, they feel better or
 worse.

I believe, however, that in most cases the change is at first
 beneficial, and that it would be to a considerable extent per-
 manent, were it not for another fallacy which extensively
 prevails. I allude to the idea that the climate itself has a
 sanative tendency, and that the breathing this or that air is

like taking so much medicine, and ought to do good *per se*. But it should be considered that the best climate is only useful as a means of taking exercise, and promoting the nutritive functions, without exposure to those drawbacks which are more or less common at home. It is by regarding exercise as necessary to securing active digestion that its importance as a therapeutic agent becomes obvious in phthisis, and any locality which will enable the sensitive invalid to go out daily on foot, horseback, or in a carriage, without the chance of meeting cold winds or showers of rain, must possess an advantage over one where these occurrences are common. All accounts agree in representing Madeira, and some other places, as more favoured in this respect than even the best localities in England—and if so, they may, in the sense referred to, be more beneficial as places of residence.

In searching for such benefits in a foreign climate, the patient has often to sacrifice the occupations he may be accustomed to at home, and the society of his friends. But if this can be done without inconvenience, and without causing mental depression or a sense of *ennui*, it may even be advantageous. Mental impressions must not be overlooked. Then he will experience a great difference between the comforts of an English residence and those in a foreign house, which, even to the healthy traveller, often prove annoying, and to the invalid are injurious. In Rome, Dr Burgess¹ says the streets are built to exclude, as much as possible, the rays of the sun, and in winter are as damp and cold as rain and frost can make them. And then he adds, "What a difference between the warm carpet, the snug elbow-chair, and the blazing coal fire of an English winter evening, and the stone stair-cases, marble floors, and starving casements of an Italian house!"²

It is well pointed out by Dr Burgess, that those who go to the large Italian cities are exposed to other dangers connected

¹ The Climate of Italy in Relation to Pulmonary Consumption. London, 1852.

² In a case in which I was recently consulted, a gentleman was advised by Professor Skoda of Vienna to visit England rather than Italy, on account of the superior comforts of the houses in the former country.

with the desire of seeing celebrated places, works of art, churches, vaults, etc., which induce great bodily fatigue, and often chill the body by long exposure to damp air, or from standing on cold marble floors.

Another evil of large continental cities consists in the attractions of fashion, so that the young can seldom resist the late evening parties, the dance or public amusements, when flushed with excitement or exertion, they return to their homes late at night, exposed to the chill air, the injurious effect of which is augmented by the previous heat and foul air of crowded assemblies. All such irregularities and every kind of over-fatigue are more than enough to counterbalance the supposed good effects of climate. Hence places of quietude, offering no temptations to gaiety, and possessing only natural advantages of scenery, and the gentle stimulus of a clear atmosphere, mild temperature, and cheerful society are the best.

Another fallacy is the idea that warmth is the agent which, in such cases does good; and people talk of a warm climate as synonymous with a healthy climate. But unaccustomed warmth is most relaxing, and tends, instead of checking, to occasion increased development of the tubercular exudation. Nothing is more common to observe in this country how phthisical patients get worse on the approach of sultry weather in summer, and how comparatively better they are in winter, so long as they avoid exposure to cold winds. In fact, it is not a warm climate which is sought for by the invalid, but a temperate climate during the winter, and a steady climate during the spring. As summer approaches many parts of the British isles are infinitely preferable.

It follows, from all the information I have been able to collect, that that climate is best which will enable the phthisical patient to pass a few hours every day in the open air, without exposure to cold or vicissitudes of temperature on the one hand, or excessive heat on the other. Wherever such a favoured locality may be found during the winter and spring months, its advantages should be considered as dependent on exercise, and on the stimulus given to the nutritive functions, rather than to its influence on the lungs directly. It is a matter

also of great importance to remember, that the comforts of home, a well-arranged diet, general hygienic rules, and a proper treatment, are as necessary in Madeira, Italy, Spain, or Egypt, as they are in Great Britain.

But, after all, the great mass of those affected with phthisis have not the means of searching out a favourable climate on the Continent, or even of maintaining themselves in a sheltered nook on the western or south-western coasts of this country. It may, therefore, be thought easy for us, by confining patients in a suite of rooms in which the heat is regulated, to secure immunity from cold and change of air; but such a contrivance is most intolerable to the patient, the mind becomes peevish, which in itself is a powerful obstacle to the proper performance of the digestive functions. But above all, the body is deprived of exercise—that necessary stimulus to the appetite, respiration, and other functions. Some years ago, I succeeded in confining a consumptive patient, whose case will be afterwards given, to his room for an entire winter. His spirits suffered greatly; but on the whole he supported the imprisonment with resolution. Next winter, however, nothing could induce him to remain at home, and one day he rushed out of the house, ascended Arthur's Seat, and was much better in consequence. Since then I have been convinced that, although by confinement you may gain some advantages, on the whole it is a prejudicial practice if rigorously carried out.

What is required in these cases is the means of exercise, whether on foot, on horseback, or in a carriage, where the patient is protected from cold winds, and where the mind can be amused by pleasant sights and cheerful conversation. Such is the case in all those favoured localities considered best for consumptive people, and some such advantages will be derived from the new Crystal Palace at Sydenham near London. Delicate individuals can be transported there by means of a close carriage, in the worst seasons, without difficulty, and on entering it, could breathe for hours a pure, balmy air, meet their friends, take exercise in various ways, read, work, or otherwise amuse themselves. Such an out-door means of recreation, combined with careful hygienic regula-

tions at home, will go far to remove many of the difficulties which we have to encounter in the ordinary treatment of consumption. So great would be the boon to the community, that, once established near London, we may soon see similar buildings in all the large cities of the kingdom. Indeed, its advantages are so obvious, that the new Hospital for Consumption, erected in Victoria Park, London, it is said will possess an extensive Green-house, or Sanatorium, which is to form part of the institution. It has also been suggested that some of the public squares in London should be covered in with glass for a like purpose, and I need not say how readily this plan could be carried out in Edinburgh.

With regard to diet, it may be said, in general terms, that one of a nutritious kind, consisting of a good proportion of animal food abounding in fat, is best adapted for phthisical cases, whilst everything that induces acidity should be avoided. But, as previously stated, the difficulty consists in causing such diet to be taken, on account of the bad appetite and dyspeptic or febrile symptoms which prevail. No effort, therefore, should be spared to overcome the obstacles which prevent food of sufficient quality and quantity from being digested, the appropriate means for doing which must vary according to the circumstances of the case, and will be treated of in the next chapter. The strongest stimulus to the appetite, however, is exercise, and hence the importance of the considerations already entered into, with reference to securing what is essential in the treatment of the disease, namely, good digestion and proper assimilation.

If the pathology of pulmonary tuberculosis formerly described be correct, it indicates what are the means best adapted for preventing, as well as arresting, the disease when it has already commenced. These are, for the infant, a healthy nurse, cleanliness, and careful attention to all those circumstances which tend to increase the bodily vigour and secure good digestion. At the time of weaning and of teething, the most watchful care becomes necessary, so that local irritation and its effects may be prevented as much as possible,

and a proper diet, containing a sufficient amount of the fatty principles be taken. During adolescence, indulgence in indigestible articles of food should be avoided, especially pastry, unripe fruit, salted provisions, and acid drinks, while the habit of eating a certain quantity of fat should be encouraged, and, if necessary, rendered imperative. The same precautions, conjoined with proper bodily and mental exercise, avoiding exhausting and too fatiguing occupations, should subsequently be maintained until the predisposition to tubercular disease has been completely overcome. In short, everything that can support and invigorate should be adopted, and everything that can exhaust and depress should be shunned. As vitiation of the chyle and blood precedes the local deposition of a tubercular exudation, it necessarily follows that that numerous class of delicate invalids, whose chief complaint is derangement of the digestive process, with languor and debility, may by the hygienic means now indicated, and proper treatment of the dyspepsia, be restored to health.

Were it possible in all cases for these three indications to be carried out, I feel satisfied the prevention and cure of phthisis would be more frequent; but in the treatment of this disease, the physician has to struggle not only with the deadly nature of the disorder, but with numerous difficulties over which he has no control, such as, among the poorer classes, the impossibility of procuring good diet, and the thousand imprudences which not only they, but the majority of invalids, are ever committing. Then another great difficulty is, to convince the patient that, notwithstanding the removal of his urgent symptoms, the disease is not cured, and that these will return, if the causes which originally produced them are again allowed to operate. Indeed, it is when the marked improvement has taken place which follows successful treatment, that the embarrassment of the physician commences. In our public institutions, the patients often feel so well that they insist on leaving the hospital, or on giving up their attendance on a dispensary. I have frequently found it impossible to prevail on such persons to continue the treatment,

and the consequence is, that again returning to their often unhealthy employment and bad diet, and exposed to the other causes favourable to the production of the disease, the distressing symptoms again recur. Many cases, with one or more caverns in the lungs, in this manner have returned to the Infirmary, under my care or that of the other physicians, from four to eight times, and on each occasion have gone out in their own opinion perfectly cured, though assured to the contrary, and urged to remain. In private practice, and especially among the higher classes, the patients are equally indisposed to persevere, though satisfied of the great benefit they have experienced. They are seduced by the pursuit of pleasure, or governed by fashion, and on the return of their symptoms, fly from one vaunted system of practice to another, visit watering-places or foreign climes, and in vain seek for that benefit which a steady continuance of a proper treatment can alone secure.

Notwithstanding the difficulties which thus present themselves in bringing about a complete cure of the disease, I have succeeded, in several cases, in ascertaining that the caverns have completely healed up, while all the symptoms and physical signs indicating their presence have disappeared, and only slight dulness on percussion, and increased vocal resonance, have remained as a proof of the puckering and induration of the pulmonary parenchyma attendant on the cretaceous concretions and cicatrices. In many of these cases, I am satisfied that had not cod-liver oil been given at the commencement of the treatment, the constitution would never have rallied from the state of exhaustion and depression under which it laboured. Some of these cases will be subsequently detailed, and they will serve to show not only the importance of the nutritive or analeptic treatment, but of the necessity of perseveringly continuing it after the more urgent symptoms have been subdued.

The general treatment for pulmonary tuberculosis now recommended, is based upon the following pathological propositions—1st, That tubercular diseases will heal of themselves, if

we can support the nutrition of the system ; 2d, That, with this view, our efforts should rather be directed to the digestive than to the pulmonary system ; and 3d, That the kind of morbid nutrition which exists is excess of albuminous and deficiency of the fatty element in the chyle. The kind of treatment applicable to correct both the lesion of the blood, as well as of the subsequent tubercular deposits, is not tonic, stimulating, or antiphlogistic, but truly analeptic or reparative, and directed to the supply of those elements of nutrition which pathology indicates are deficient in this class of diseases.¹

It has been endeavoured to be shown that these principles of treatment have been long understood and put in practice. Passages have been cited from the lectures of Dr Gregory, and from the writings of Fuller, Morton, Christopher Bennett, and even the ancient Greek physicians, to prove that nutrients and oil were administered by them. Any one, however, who will consult the writings of these physicians, will find that, although in some cases a greater or less approach to an invigorating system of practice was tried, and, as it is said, with occasional good effect, yet it was never based upon pathological principles, or advocated as the only method capable of arresting and overcoming the disease. In consequence, the general treatment of the profession has, on the whole, been antiphlogistic, to combat supposed inflammation ; lowering, to subdue febrile irritation ; and palliative, to relieve occasional symptoms. It consisted of antimonials, cough mixtures, and opiates, leeches applied frequently to the chest, and occasionally general bleeding ; sulphuric acid to relieve the sweating ; astringents to stop diarrhœa or hæmoptysis ; now and then counter-irritants, and towards the termination of the disease, wine and stimulants. As diet, milk and farinaceous food were the rule, and meat the exception. Under such a system of practice, it need not be wondered that consumption should be regarded as almost a uniformly fatal disorder. A few practitioners, it is true, adopted an

¹ See Report of Discussion in the Edinburgh Medico-Chirurgical Society—Monthly Journal, April 1853.

opposite line of practice, and, like the late Dr Stewart of Erskine, they conjoined the exercise recommended by Sydenham, with the free administration of beef-steaks, porter, and cold bathing. But such practice, whatever partial success it may have met with, has never been general, because opposed to the theory which ascribed the disease to inflammation, and the idea that inflammation must be combated by antiphlogistics. "Hence," says Sir James Clark, "the cases likely to be cured by the stimulating plan of treatment—by the beef-steak and porter system—bear so small a proportion to those which would be injured by it, that I do not consider it deserving of notice."¹ During the last twelve years, however, a revolution in practice has gradually been going on. The good effects of cod-liver oil have been made apparent, the pathology of the disease has been advanced, and the necessity of causing assimilation of the fatty elements of nutrition is now recognised. Why a meat diet and stimulants do not succeed in the majority of cases I have previously explained, and how it is oil and fat, in whatever way they are introduced into the system, whether by the mouth, by inunction, or by the rectum, does produce the desired effect, we trust has also been made apparent. Should, therefore, the analeptic or reparative system of treatment become general, a perceptible diminution in the mortality of phthisis may be confidently expected, a result which, according to Dr Wood of Philadelphia,² has already been made apparent in the principal cities of the United States, where, since cod-liver oil has been extensively used, the deaths have diminished from 14.8 to 12 per cent.

¹ On Pulmonary Consumption. 1837. P. 397.

² Practice of Medicine, vol. ii., pp. 63-95. 3d Edit.

CHAPTER III.

SPECIAL TREATMENT OF PULMONARY TUBERCULOSIS.

UNDER the head of General Treatment of Phthisis Pulmonalis, I have pointed out the means of meeting the three indications which should never be lost sight of in this disease. But every case requires a special treatment in addition, which will depend on the unusual severity of this or that symptom, or the existence of peculiar complications. It is to the undue importance given to this special, as distinguished from the general treatment, that I attribute much of that want of success experienced by practitioners. Thus it is by no means uncommon to meet with patients who are taking at the same time a mixture containing squills and ipecacuanha to relieve the cough; an anodyne draught to cause sleep and diminish irritability; a mixture containing catechu, gallic acid, tannin, or other astringents, to check diarrhœa; acetate of lead and opium pills to arrest hæmoptysis; sulphuric acid drops to relieve the sweating; quinine, iron, or bitters, as tonics; wine to support the strength; and cod-liver oil in addition. I have seen many persons taking all these medicines, and several others at one time, with a mass of bottles and boxes at the bedside sufficient to furnish an apothecary's shop, without its ever suggesting itself apparently to the practitioner, that the stomach, drenched with so many nauseating things is thereby prevented from performing its healthy functions. In many cases there can be little doubt that this treatment of symptoms, with a view to their palliation, whilst it destroys all hope of cure, ultimately even fails to relieve the particular functional derange-

ment to which it is directed. Hence, although the special treatment of phthisis is a matter of great importance, it should be subordinate to general rules.

One or more of the following symptoms may be complained of during the progress of an individual case, and require to be treated according to the curative indications formerly given.

Cough and Expectoration.—At first the cough in phthisis is dry and hacking. When tubercle softens or bronchitis is present, it becomes moist and more prolonged. When excavations exist, it is hollow and reverberating. In every case cough is a spasmodic action, occasioned by exciting the branches of the pneumogastric nerves, and causing simultaneous reflex movements in the bronchial tubes and muscles of the chest. The expectoration following dry cough is at first scanty and muco-purulent, and afterwards copious and purulent. When it assumes the nummular form,—that is, occurs in viscid rounded masses, swimming in a fluid clear mucus, it is generally brought up from pulmonary excavations. The accumulation of the sputum in the bronchial tubes is an excitor of cough; and hence the latter symptom is often best combated by those means which diminish the amount of sputum. When, on the other hand, the cough is dry, those remedies should be used which diminish the sensibility of the nerves. In the first case, the amount of mucus and pus formed will materially depend on the weakness of the body and the onward progress of the tubercle. Hence good nourishment and attending to the digestive functions are the best means of checking both the cough and expectoration; whereas giving nauseating mixtures of ipecacuanha and squills is perhaps the worst treatment that can be employed. There is no point which experience has rendered me more certain of than that, however these symptoms may be palliated by cough and anodyne remedies, the stomach is thereby rendered intolerant of food, and the curative tendency of the disease impeded. On the other hand, nothing is more remarkable than the spontaneous cessation of the cough and expectoration on the restoration of the digestive functions and improvement in nutrition.

When the cough is dry, as may occur in the first stage, with crude tubercle, and in the last stage, with dry cavities, counter-irritation is the best remedy, employed in various forms. Opium may relieve, but it never cures. (See also Chapter IV.)

Loss of Appetite and Anorexia.—These are the most constant and important symptoms of phthisis, inasmuch as they interfere more than any other with the nutritive processes. If food, or its substitute, cod-liver oil, cannot be taken and digested, it is vain to hope for amelioration in any of the essential symptoms of the disease. Here we should avoid a mistake, into which the inexperienced are very liable to fall. Nothing is more common for phthisical patients to tell their medical attendants that their appetite is good, and that they eat plentifully, when more careful inquiry proves that the consumption of food is altogether inadequate, and that they loathe every kind of animal diet. We should never be satisfied with general statements, but determine the kind and amount of food taken, when sufficient proof will be discovered in the vast majority of cases, of the derangement of the appetite and digestive powers formerly alluded to. Very commonly also, there will be acid and other unpleasant tastes in the mouth. In all such cases, especially if too much medicine has been already given, the stomach should be allowed to repose itself before anything be administered, even cod-liver oil. Sweet milk, with toasted bread, and small portions of meat nicely cooked, so as to tempt the capricious appetite, should be tried. Then ten drops of the Sp. Ammon. Aromat., given every four hours in a wine glassful of some bitter infusion, such as that of Columbo or Gentian, with a little Tr. Aurantii, Tr. Cardamomi, or other Carminative. In this way the stomach often regains its tone, food is taken better, and then cod-liver oil may be tried, first in teaspoonful doses, cautiously increased. Should this plan succeed, amelioration in the symptoms will be almost certainly observed.

Nausea and Vomiting.—Not unfrequently the stomach is still more deranged; there is a feeling of nausea and even

vomiting on taking food. In the later stages of phthisis, vomiting is also sometimes occasioned by violence of the cough, and the propagation of reflex actions, by means of the par vagum, to the stomach. In the former case, the sickness is to be alleviated by carefully avoiding all those substances which are likely to occasion a nauseating effect, not overloading the stomach, and allowing it to have repose. In cases where too much medicine has been administered, a suspension of all medicaments for a few days will frequently enable the practitioner to introduce nourishment cautiously with the best effect. I have found the following mixture very effectual in checking the vomiting in phthisis. \mathcal{R} Naphthæ. Medicinalis, $\mathfrak{z}\mathfrak{j}$.; Tr. Cardamomi comp., $\mathfrak{z}\mathfrak{j}$.; Mist. Camphoræ, $\mathfrak{z}\mathfrak{v}\mathfrak{i}\mathfrak{j}$. M. ft. Mist. Of which a tablespoonful may be taken every four hours. When it depends on the cough, those remedies advised for that symptom should be given. I have tried emetics for the relief of nausea and vomiting, but with no good result.

Diarrhœa.—This is a very common symptom throughout the whole progress of phthisis, at first depending on the excess of acidity in the alimentary canal, to which we have alluded, but in advanced cases, connected with tubercular deposition and ulceration in the intestinal glands. The best method of checking this troublesome symptom, is by improving the quality and amount of the food. The moment the digestive processes are renovated, this, with the other functional derangements of the alimentary canal, will disappear. Hence at an early period we should avoid large doses of opium, gallic acid, tannin, and other powerful astringents, and depend upon the mildest remedies of this class, such as chalk with aromatic confection, or an antacid, such as a few grains of carbonate of potash. When, on the other hand, in advanced phthisis, continued diarrhœa appears, and is obstinate under such treatment, then it may be presumed that tubercular disease of the intestine is present, and the stronger astringents with opium may be given as palliatives.

Hemoptysis.—This symptom sometimes appears suddenly in

individuals in whom there has been no previous suspicion of phthisis, and in whom, on careful examination, no physical signs of the disease can be detected. On other occasions, the sputum may be more or less streaked with blood; and lastly, it may occur in the advanced stage of the disease, apparently from ulceration of a tolerably large vessel. In all these cases the best remedy is perfect quietude, and avoidance of every kind of excitement, bodily and mental. Astringents have been recommended, especially acetate of lead and opium; but how these remedies can operate, I am at a loss to understand; and I have never seen a case in which their administration was unequivocally useful. I have now met with several cases where supposed pulmonary hemorrhage really originated in follicular disease of the pharynx or larynx, and which, with the supposed phthisical symptoms, were removed by the use of the probang and nitrate of silver solution. (See Chapter IV).

Sweating I regard as a symptom of weakness, and therefore as a common, though by no means a special, one in phthisis. Here, again, the truly curative treatment will consist in renovating the nutritive processes, and adding strength to the economy. It will always be observed, that if cod-liver oil and good diet produce their beneficial effect, that the sweating, together with the cough and expectoration, cease. On the other hand, giving acid drops to relieve this symptom, as is the common practice, by adding to the already acid state of the alimentary canal, is directly opposed to the digestion of the fatty principles, which require assimilation.

It should not be forgotten that consumptive patients, and all those suffering from pulmonary diseases, are especially sensitive to cold. The impeded transpiration from the lungs in such cases, is counterbalanced by increased action of the skin, which becomes unusually liable to the action of diminished temperature. Again, cold applied to the surface immediately produces, by reflex action, spasmodic cough and excitation of the lungs. Every observant person must have noticed how cough is induced by crossing a lobby, going out into the open

air, a draught of wind entering the room, getting into a cold bed, etc. etc. The mere exposure of the face to the air on a cold day, takes away the breath, induces cough, and obliges the patient instinctively to muffle it up. The numerous precautions, therefore, that ought to be taken by the phthisical individual, should be pointed out, especially the necessity of warm clothing, to which large additions should be made on going out into the air. Thus, covering the lower part of the face is important as a means of extra clothing, and not as a means of breathing warm air, as the favourers of respirators imagine. The patient should always sit with his back to the horses or to a steam-engine, and if by accident his shoes or clothes become wet, they should be changed as soon as possible. In the house, ladies should have a shawl near them, to put on in going from one room to another, in descending a stair to dinner, etc. By attention to these minutiae, much suffering and cough may be avoided.

Febrile Symptoms.—The quick pulse, general excitement, loss of appetite, and thirst, which are so common in the progress of phthisical cases, are dependent on the same causes which induce symptomatic fever in general. Vascular distension, resulting in exudation and its absorption, is proceeding with greater or less intensity in the lungs, and frequently in other organs. This leads to nervous irritation and increase of fibrin in the blood, accompanied by febrile phenomena. The intensity of these is always in proportion to the activity of local disease, or to the amount of secondary absorption going on from the tissues, or from morbid deposits. Nothing is more common than attacks of so-called local inflammations in phthisis, and the careful physician may often determine by physical signs the supervention of pleurisy, pneumonia, or bronchitis, in the previously observed lesion, and not unfrequently laryngitis, enteritis, or other disorders. In such cases, nature herself dictates that the analeptic treatment otherwise appropriate, is no longer applicable—food disgusts, and fluids are eagerly demanded. Under these circumstances, it has been common to apply leeches to the inflamed part, and extract blood by

cupping, measures which undoubtedly cause temporary relief, but which are wholly opposed to the plan of general treatment formerly recommended, and to what we know of the pathology of the disease. Every attack of febrile excitement is followed by a corresponding collapse, and it should never be forgotten that in a disease which is essentially one of weakness, the patient's strength should be husbanded as much as possible. Hence the treatment I depend on in such circumstances, consists of the internal administration of the neutral salts, especially of tartar emetic in small doses, combined with diuretics, in order to favour crisis by the urine. I have satisfied myself that such attacks are not to be cut short by leeches or cupping, and although in many cases, as previously stated, temporary relief is produced, the exposure of the person, and unpleasant character of the applications, the trickling of blood, and wet sponges, as often irritate, and give rise to unnecessary risk. Still there may be cases where topical blood-letting, if it cannot be shown to advance the cure, neither can it be proved to have done harm, but these cases of late years have, as far as my observation goes, been very few in number. In the rapidly febrile cases, or the so-called instances of acute phthisis, mercury has been recommended, which I have never seen produce the slightest benefit.

Debility.—This is a very common symptom of phthisis from the first, and frequently leads the patient into indolence both of mind and body, a condition very unfavourable for stimulating the nutritive functions, upon the successful accomplishment of which its removal depends. It is to remove the weakness that tonics have been administered, but I have never seen quinine, bitter infusions, or even chalybeates, of much service alone, while the continual use of nauseous medicine disgusts the patient, and interferes with the functions of the stomach. Here again the great indication is to remove the dyspeptic symptoms, give cod-liver oil, an animal diet, and improve the appetite by gentle exercise and change of scene. Should the practitioner succeed in renovating the nutritive functions, it is often surprising how the strength

increases, in itself a sufficient proof as to what ought to be the method of removing the debility. I have frequently seen patients who have been so weak that they could not sit up in bed without assistance, so strengthened by the analeptic treatment, that they have subsequently walked about and taken horse exercise without fatigue, and this after all the vegetable, mineral, and acid tonics have been tried in vain.

Despondency and Anxiety.—It is impossible for the careful practitioner to avoid noticing the injurious influence of depressing mental emotions on the progress of phthisis. Indeed the worst cases are those of individuals with mild, placid, and unimpassioned characters, who give way to the feelings of languor and debility which oppress them. Such persons are most amiable patients—they give no trouble, any thing will do for them—they resign themselves to circumstances, and state that they are eating well and getting better up to the last. These are cases of bad augury, and it is exceedingly difficult to inspire them with sufficient energy to take exercise, or to carry out those regulations which are absolutely essential to renovate the appetite or nutritive functions. Such persons are benefited by slow travelling, cheerful society, and everything that can elevate the spirits, and, insensibly to themselves, communicate a stimulus to the mental and bodily powers. Anxiety, on the other hand, though it may sometimes depress and interfere with the digestive functions, is often a most useful adjunct to the physician. They who experience it are most careful of their health, sometimes indeed too much so, but if once satisfied of the benefit of any particular line of treatment, they pursue it with energy. These are cases of good augury, and most of the permanent cures I have witnessed have been in such persons—medical men, and others acquainted with the nature of their disease, who have exhibited resolution, a noble fortitude, and bravely struggled against local pain, general debility, and nervous fear.

The excessive confidence placed in particular remedies, such as cod-liver oil, or especial modes of proceeding, whether a

sea voyage or residence in a particular climate, has done much mischief in phthisical cases. For instance, it is rare that the administration of cod-liver oil will prove sufficient to conduct a case of pulmonary tuberculosis to a happy conclusion. It is the more important to notice this, since it has become an object of commercial enterprise, and its use in every disease advocated; for, although it will frequently check phthisis for a time, and nourish the exhausted frame, great attention to the future progress of the case, and a careful management of the various symptoms and conditions presented, will be necessary, before the crude tubercles become cretaceous and encysted, or ulcerations in the lungs completely cicatrized. At present this remedy is very extensively given, and its temporary good effects are allowed; but few persons in this country have watched for a sufficiently long time the progress of phthisical cases placed under its influence, so as to enable them to speak with any confidence as to the ultimate result. To prevent disappointment, therefore, and the abandonment of a valuable remedy from its excessive and injudicious administration, it may be useful to detail, shortly, a few cases of phthisis which have been under my observation, for periods varying from five to ten years, and indicate the other circumstances it will be necessary to attend to, with a view of rendering even cod-liver oil of permanent advantage. It is only by thus studying individual examples of the disease, and observing the numerous and varied combinations of symptoms and indications that each presents, that the special treatment of phthisis and the difficulties the practitioner has to combat, can in any way be understood. Statistical details, by which the effects of any plan of treatment are tested, by jumbling together cases essentially different in their nature and progress, so far from assisting the practitioner, or advancing our knowledge, are not only useless at the bedside, but, by causing an idea of certitude, which has no real existence, must ultimately lead to great disappointment.

The following case, which has been under my observation for ten years, will exhibit some of the numerous conditions that present themselves, and the watchful care necessary

in order to conduct the disease towards a favourable termination :—

CASE XV.—*Advanced Pulmonary Tuberculosis, 1842; A Large Cavity in the Apex of Right Lung, and Condensation in the Apex of Left Lung, with all the Phthisical Symptoms, including repeated Hemoptysis, in 1843; Arrestment of the Disease, and complete Recovery in 1846; Health remains good, 1853.*

A medical student requested me to examine his chest, in the autumn of 1842. He was tall, thin, and sallow, aged twenty, with frequent cough, accompanied by purulent expectoration. On percussion, there was marked dulness on the right side, beneath the clavicle. On listening in this situation, a loud mucous râle accompanied the inspiratory murmur, and there was loud bronchophony. On the left side the inspiratory murmur was harsh, the expiratory murmur prolonged, but no increased vocal resonance could be detected, and no dulness on percussion. I ascertained that his illness had been progressing slowly for at least several months, that he had latterly become much emaciated, that there was considerable perspiration at night, that his appetite had been very capricious, but was now good, and that there had been no diarrhœa. The pulse was quick, the tongue furred, and he complained of slight thirst. I learnt from his friends, however, that his appetite was wretched, and that it was very seldom that he could be brought to eat any animal food whatever. This young man, therefore, had a considerable amount of tubercular exudation in the apex of the right lung, which was softening, and a much slighter amount of it in the apex of the left lung, which was still crude. I prescribed a tablespoonful of cod-liver oil three times a day, and good diet. I told him to clothe himself well, avoid sudden changes of temperature and exposure to cold, and during the winter months to confine himself to his room, the temperature of which was to be regulated between fifty and sixty degrees.

I saw him occasionally during the winter of 1842–3, during which period it became necessary to suspend the use of the

oil every now and then, on account of the nausea it occasioned. His health and strength, however, greatly improved, and the moist râles entirely disappeared, although he continued to expectorate a small quantity of viscous purulent matter. It was with the utmost difficulty he could be confined to his apartment, and it at length became so irksome, that he went out without my knowledge. At first he used considerable caution, and no ill effect arose; but, in May 1843, I was summoned to him in great haste. He had spent the previous evening with some companions, had drank more than usual, and walked home past midnight, the weather being rather chilly. I found the cheeks flushed, strong febrile symptoms, laborious breathing; and, on auscultation, loud crepitating, passing into mucous râles were heard over the upper third of right side, with the same dulness on percussion as formerly. I prescribed quietude, with tartar-emetic and opium in large doses, frequently repeated. In a few days the fever had left him, but the moist râles in the right lung continued; the expectoration was again copious, the sweating at night had returned, and there was an unconquerable repugnance to every kind of food. Various means were tried to diminish the irritability of the stomach—effervescing powders, hydrocyanic acid, creosote, various anodynes, stimulants, alkalies, and bitters—but without avail. In June, he was reduced to a condition much worse than when I at first saw him, and was once more greatly emaciated, and so weak that he could not stand five minutes, without enduring great fatigue. I now ventured to prescribe the oil again, in teaspoonful doses, combined with a drop of the oil of cloves, three times a day. It was retained on the stomach, and was taken regularly for two weeks, at the end of which period he had greatly improved. After a time, the dose was increased to a tablespoonful twice, and then three times, a day. In August, all moist râles had again disappeared, and were replaced by a distant blowing murmur, with loud bronchophony. The apex of the left lung fortunately had undergone no change since I first examined it. He was now able to walk, his strength having been much restored; and I informed him of the

critical position in which he was, and impressed upon him the necessity of great caution. He seemed thoroughly roused to a sense of his danger, and left Edinburgh to see his friends in the country.

In November 1843, he returned to continue his studies in the University. With the exception of being somewhat stronger, and in better spirits, he was in much the same condition as when I last saw him. The problem now was, how to get him over the ensuing winter. I was in hopes that if, during the next six months, no fresh exudations occurred, and the cavity or cavities in the right lung remained dry, that they might ultimately cicatrise. I, therefore, advised him not to attend classes at all, and make up his mind to remain in his own lodgings, which were to be chosen especially for the purpose, and kept at an equable temperature. Accordingly, when the weather became cold—which, however, was not until January—he remained at home, and although the confinement was exceedingly irksome, he bore it with great resolution. It was about this period I first noticed strong friction or creaking murmurs at the apex of the right lung, which indicated that the pleuræ in that situation were greatly affected.

Matters remained in this condition until February 1844; I every day expecting that he would break from his confinement, or commit some imprudence which would induce fresh exudation in the lung. At this time I was sent for late at night, and found him greatly alarmed. In the course of an hour he had spat up about a pint of florid blood, and when I saw him he was coughing violently, and expectorating frothy mucus, deeply tinged of a red colour. I advised him to restrain the cough and efforts at expectoration. I sat with him some time, his excitement gradually diminished, and the cough and hæmoptysis ceased. He told me that for some days he had experienced considerable tightness and a sense of constriction in the upper and right part of his chest. On asking him whether this continued, I ascertained that it had completely disappeared. On auscultation, I heard loud friction râles, like the creaking of leather, over the apex of right lung. The inspiration was accompanied by a hoarse blowing murmur.

The expiration prolonged; and there was the same loud bronchophony. Sounds over left lung the same as formerly. It was evident to me, from this examination, that the cavity was contracting; that in doing so, some blood-vessels had been ruptured, and that much was now to be feared from repeated attacks of hæmoptysis. For a period of four months, indeed, he now had occasional returns of spitting of blood, varying in quantity, but rarely exceeding three ounces in amount, and sometimes only slightly tinging the sputa. He was treated at these times by means of quietude, opiates, and acetate of lead, none of which, however, appeared to me to possess any counteracting effect, as the hæmoptysis was evidently the result of changes in the lung, in connection with the contraction of the tubercular ulcers. He always felt more or less constriction in the chest before any considerable hemorrhage, which was invariably relieved by it. Occasionally, also, he experienced considerable dyspnœa, and an intense longing for fresh air. On one of these occasions in April, he rushed out of his lodgings, and walked rapidly on the Calton Hill, when he found the dyspnœa left him. He insisted on repeating this on similar occasions, and he assured me it always produced the desired effect. As the season advanced, he prolonged his walks. A very common one with him was to the summit of Arthur's Seat, and in June all hæmoptysis and dyspnœa left him. He recommenced his studies also in the University at the commencement of the summer session in May.

At the end of July, I again carefully examined his chest. Although dulness under the right clavicle still continued, I was satisfied it was not so intense as formerly. On auscultation, there were loud friction noises, which completely masked the respiratory murmurs. The vocal resonance continued. On the left side there was still slight roughness of the inspiration, and prolongation of the expiration, but nothing more. His general health, though far from good, was much improved. He was still pale and thin. There was occasionally cough and tough expectoration. The appetite, he said, was good, and the bowels regular. I again cautioned him to avoid all exposure to cold and damp—to live well—to take exercise—

and apply occasional counter-irritation to his chest, and he left Edinburgh for the autumnal recess.

In November 1844 he returned to Edinburgh. He was greatly improved in appearance, and described himself as being much stronger. During the holidays he had used horse exercise frequently, and been much in the open air. There was still occasional cough and tough expectoration, not tinged with blood. The physical signs were much the same as when I last saw him, although the intensity of the friction-murmurs had somewhat diminished. He positively refused to confine himself the next winter as he had done the last, being convinced that he could not breathe the confined air of a chamber without injury; and it was with some difficulty that I obtained a promise from him not to go out during wet, or unusually severe cold weather. Every other precaution to avoid exposure to cold, and all exciting causes of exudation, was to be carefully observed. He attended his classes regularly for six weeks, when, owing to the weather, he lost several lectures. This caused him great annoyance,—the more so, as he intended to present himself for examination in the spring.

About the middle of January 1845, he sent for me. I found him with the face flushed, skin hot, rapid pulse, coughing violently, and expectorating a muco-purulent matter, tinged of a rusty colour. On listening over the apex of the right lung, there were heard crepitating and mucous râles, mingled with friction murmurs similar to those which formerly existed. The rest of the lung was free. The apex of left lung was not affected. It was clear that a new attack of pulmonary congestion and exudation had taken place. He confessed that he had been very unwilling to send for me; that he had felt himself getting worse for the last week, and was conscious that the attack had been occasioned by his persistence in attending classes, and sitting so many hours probably in damp clothes and wet boots. The same treatment as was adopted on a former occasion was again put in force—quietude, with tartar-emetic and opium. In a week, the febrile symptoms had much abated, but the pulse continued quick; the appetite was destroyed, and his strength was again much reduced. All

attempts to eat occasioned nausea and disgust—he could take no animal food. The tongue was loaded, and there were almost continued acid eructations. I ordered tartar-emetic ointment to the chest; and, instead of the tartar-emetic and opium internally, prescribed 8 grains of carbonate of magnesia, with ℥j. of sal volatile, to be taken three times a day in a bitter infusion. Three days afterwards, I was much alarmed at the occurrence of diarrhoea for the first time, which continued two days, and evidently diminished his strength. Fortunately it ceased on suspending the mixture, and giving aromatic and astringent powders, with a quarter of a grain of powdered opium. In the beginning of February my patient was once again reduced to nearly the same condition that he had presented three years previously. I was encouraged, however, on listening to his chest, by hearing only the friction and dry cavernous râles at the apex of the right lung. The crepitation had disappeared, and occasional mucous râle was heard about the middle of the right back. I made every effort now to re-establish the appetite, and introduce nourishment. Solid animal food and cod-liver oil were immediately vomited. All that he could retain in the stomach was a little rice pudding and milk. It was evident to me that unless the stomach could be quieted and rendered capable of digestion, that he must sink. For two days I tried small doses of liquor potassæ and vegetable bitters, with effervescing draughts. I then gave a teaspoonful of cod-liver oil, but it caused insupportable nausea, and was vomited several times, although mixed with several essential oils in succession. The oil was therefore suspended, and ten drops of naptha, with ℥j. of tincture of cardamons in ℥j. of infusion of Colomba, given three times a day. This medicine evidently checked the tendency to nausea and vomiting, and after continuing it three days, the cod-liver oil was again tried, and was now retained in teaspoonful doses. During the next fortnight it was found necessary to suspend the oil on two separate occasions, and to have recourse to the naptha mixture. At the end of that time, however, he took it in dessert-spoonful doses, and from this period he once more began to recover.

It is unnecessary to record all the successive steps his improvement presented. In April he could again sit up, and at this time was taking four tablespoonfuls of the oil daily. At the end of that month he went out, and commenced taking gentle exercise whenever the weather permitted; and in May he was in much the same condition as at the commencement of the winter session. On examining his chest, I now noticed marked flattening under the right clavicle. All moist râles had disappeared. Friction râles could only be heard at the end of a deep inspiration—there was loud bronchophony, and considerable dulness on percussion.

During the summer session he attended his classes with tolerable regularity, and prepared himself for his examination. On this subject he was very anxious; indeed much more so it appeared to me, than he was with respect to his health. Seeing now his anxiety on this subject, I also became desirous that his mind should be relieved. He accordingly left Edinburgh about the end of July for London, where shortly after he passed the examinations at the College of Surgeons and at Apothecaries' Hall. On the approach of winter he wrote to me, saying that he was much better, and that he intended passing the winter with some relations in the West of England. He seemed to be impressed with the importance of avoiding every cause which could again excite a fresh pulmonary attack, and promised implicit obedience to my oft-repeated instructions. I heard from him from time to time, and he passed through the winter without accident.

It was in London during August 1846, that I once more examined my patient's chest. There was still marked dulness under the right clavicle, but it was by no means so deep or so extensive as formerly. There was a considerable hoarse murmur during inspiration, but the blowing character had disappeared. The expiration was prolonged and accompanied by a sibilant murmur. The vocal resonance was greatly increased. He was still pale and thin, but capable of taking considerable exercise. Every now and then he felt constriction in the right chest, which was removed by exercise in the open air. There was also occasional cough, but no expectoration. He gave

me three cretaceous concretions, about the size of large pins' heads, which he had past up the previous spring. He lived on the plainest animal food, and drank nothing but milk and water. His appetite had of late considerably improved, and he was now free from all dyspeptic symptoms. He had continued to take three tablespoonfuls of the oil daily up to a late period. I recommended his taking two tablespoonfuls of the following mixture three times a day:—℞ *Ferri Citratis*, ℥ij.; *Syr. Aurantii*, Tr. *Card. c. aa.* ʒj.; *Inf. Colombæ.* ʒiv. M.

He now established himself as a general practitioner in one of the midland counties of England, where he has been practising ever since. In the autumn of 1849, I again saw him. His appearance then and now is robust. He takes considerable exercise daily. There is no cough or expectoration. There is considerable flattening of the chest below the right clavicle; but he inspires freely, and without difficulty. On percussion the sound is still dull, but much less so, and more limited in extent, than formerly. On auscultation, there is almost complete absence of respiratory murmurs at the apex of lung, but a little lower down there is prolonged expiration, which is gradually lost in the healthy breath sounds. There is great increase of vocal resonance, probably owing in part to the density of the adhesions, and in part to the condensation and puckering of the lung. The left lung is healthy. He took the chalybeate and bitter mixture for some time with marked advantage. He found the appetite improve and his strength increase. At present he takes no medicine, eats heartily, and drinks only milk and water. His age is now thirty-one.

In this case (of which, notwithstanding its length, I have only given a sketch, rather than a minute report), I presume there took place in the lung the same morbid changes as were described in Case I. (p. 37). In that case, cicatrization of the tubercular cavity occurred spontaneously—in the other, the disease was subjected to a long treatment; and it may be fairly asked, whether art was in any way connected with the happy result? A reply to this question will be facilitated by paying attention to the facts of the following case:—

CASE XVI.—*Scrofula ; Necrosis of the Femur and Pulmonary Tuberculosis, with a large Cavity in the apex of Right Lung, and Condensation in the apex of Left Lung, in July 1849 ; All the Phthisical symptoms complicated with Cardiac disease, Complete Recovery, Arrestment of the Disease, and Cicatrization of the Cavern in December 1851 ; Health has since remained good, 1853.*

Patrick Barclay was admitted, July 25, 1849, at the age of fifteen, into the Clinical Ward of the Royal Infirmary, under my care. He was greatly emaciated, and complained of cough and difficulty of respiration, both which symptoms were easily excited, and occasionally severe and prolonged. His previous history indicated that he had been of scrofulous habit from infancy—that he had been the victim of poverty, and obtained a very insufficient diet. He had for some time been a member of the industrial school, where he was learning the trade of a shoemaker. Twelve months previously, he had injured his right thigh by a fall, since which time he had been unable to walk much, and scrofulous disease of the femur, with a fistulous opening, was induced, and was still present. He had continued to attend the school, however, until a week before admission, when the cough, expectoration, and dyspnœa became so urgent that he was confined to bed.

On examining the chest the day after his admission, percussion determined the existence of comparative dulness over the whole of the right side, most marked under the clavicle. On the left side there was slight dulness under the clavicle. On auscultation, distinct bronchophony, with loud friction and mucous rattles, approaching cavernous, were heard over the upper third of the right lung anteriorly, and superiorly becoming more faint inferiorly. On the left side, friction noises were heard above and immediately below the clavicle. Posteriorly on the right side, the bronchophony was not so loud, but the moist rattles were the same as in front. In addition to the severe cough and dyspnœa, there was copious expectoration of a viscid frothy sputum, tinged with blood. The pulse was 114, strong and sharp. The heart's apex beat below the sixth rib ; im-

pulse increased, but percussion did not indicate lateral enlargement. On auscultation, a chirping musical murmur was heard over the apex of the heart, at the end of the first sound becoming more faint towards the base. * Over the left edge of the manubrium of the sternum, a bellows murmur took the place of the second sound, easily detected when the breath was held, but during respiration masked by loud friction sounds. The tongue was slightly furred; appetite good; some thirst; bowels regular; urine natural, specific gravity 1020, not coagulable. The chest, face, and arms were covered with a pruriginous eruption. Profuse sweating at night. On the inner part of the right thigh, about four inches above the knee, there were several cicatrices, and three sinuses which led to necrosed portions of the femur, pouring out a profuse discharge. His general weakness was so great that he could not stand. He was ordered full diet, with half a pint of sweet milk morning and evening; a dessert-spoonful of cod-liver oil three times a day; an anodyne and antispasmodic mixture to relieve the cough and dyspnoea; tartar emetic ointment to be rubbed over the upper part of right chest.

During the following fortnight, the moist rattle under the right clavicle became a coarse gurgling, but the chirping sound at the apex of the heart, although it disappeared and returned at intervals, became gradually more faint. The cough was occasionally so severe and suffocative as to induce vomiting, but appeared to be allayed on substituting a naphtha for the mixture formerly ordered. He then began slowly to improve, but he was ordered to omit the oil, as it occasioned nausea, and a seton was introduced below the right clavicle. In the beginning of August, all moist rattles below the right clavicle were replaced by hoarse dry murmurs. The suffocative cough and vomiting had ceased, and he was ordered a tablespoonful of the following mixture three times a day:—*R. Ferri. Citratis*, 5ss.; *Tr. Aurantii*; *Syrupi. aa.* 3ss.; *Infus. Columbæ*, 3v. On the 7th of September, his general appearance was much improved, and the sounds in the pulmonary cavity under the right clavicle continued dry. The seton produced so much local irritation that it was withdrawn. To

take a tablespoonful of cod-liver oil three times a day, and omit the mixture. October 28th, the report was:—"Musical murmur of the heart has entirely disappeared. He is becoming quite fat, and so strong that he is able to go about the ward all day. Complains only of slight cough at night, and palpitation on exertion. The right infra-clavicular region is becoming flat, pulmonary sounds the same. To omit the cod-liver oil. November 18th—The cough has returned, with slight mucous expectoration, owing, as it is supposed, to some imprudent exposure to the weather on his part. On auscultation, mucous and sibilant râles are heard all over the chest. He was ordered to take the oil again. From this time he rapidly improved. The cavity became perfectly dry, and respiration over it was accompanied by blowing murmurs. The cough and expectoration greatly diminished, and his general appearance became healthy, and he grew very stout. On January 13th, it is noted that, on percussion, a distinct crack-pot sound is heard in the right infra-clavicular region, and faintly also on the left side. On auscultation, the heart's sounds are loud all over the chest, the second sound being accompanied with a distinct bellows murmur. Musical murmur has never returned. There is bronchophony and prolonged expiration in the right infra-clavicular region, but no moist sounds. Sleeps well, and is very little troubled with cough. Does not sweat; is very fat; appetite good. This boy, as far as all general symptoms are concerned, may be regarded as having been in good health for the last two months."

He was dismissed from the Infirmary, February 27, and visited me on the following day, when I ascertained, on careful examination, his condition to be as follows, and made the following note:—"On percussion, the chest is tolerably resonant on both sides; but there is slight dulness under the right clavicle. On auscultation, the inspiration is loud, and of a blowing character, in right infra-clavicular region; but the murmur is much softer than formerly. Expiration is still prolonged, and there is considerable vocal resonance, but not amounting to bronchophony—no moist râles. In the corresponding situation on the left side, the inspiration is somewhat

harsh, and respiration slightly prolonged; vocal resonance normal; loud bellows murmur, with the second sound of the heart, heard over nearly the whole chest. His general health is good; he expresses himself as being quite well. He appears stout and strong; but his countenance is somewhat sallow and cachectic. He has no expectoration or sweating, and the cough is trifling, and only present in the morning. He is about to return to the Industrial School, and resume the learning of his trade as a shoemaker."

He was re-admitted into the Infirmary, August 26th, 1850. After leaving the house he had been frequently exposed to cold, but had been at the Industrial School,—and latterly the cough and expectoration, which he said had quite left him, returned, and gradually became more severe. The sweating returned with the cough. A week before admission, he, with the other boys of the school, went to Portobello to bathe, and, notwithstanding his remonstrances, the master insisted on his going into the water, saying it would do him good. He however became much worse. On admission, the physical signs were, coarse moist râle under the right clavicle, imperfect pectoriloquy, and creaking friction noises; under left clavicle, harsh inspiration, and prolonged expiration, but the dulness in this position is very slight, when compared with that of the opposite side. He again, by means of cod-liver oil, good diet, and counter-irritation, became strong and stout; the cough, expectoration, and other symptoms ceased, and he was discharged March 7th, 1851. The report on that day, is "marked dulness and increased vocal resonance under right clavicle; the inspiration is harsh but dry."

He was once more admitted, July 5th, 1851, and it appeared that, on leaving the ward in March, two detached pieces of his right thigh bone were extracted by Mr Syme, and he remained in the surgical hospital for five weeks. Subsequently he had been constantly employed in light garden work, and, notwithstanding poverty of food, he had continued in tolerably good health till a week previous. The report says—"On percussion, there is slight dulness only under the right clavicle, and posteriorly the resonance is good and equal on both sides.

Under the right clavicle, the inspiration is heard to be harsh and blowing—no moist râle. There is also loud double friction murmur over the upper fourth of right lung, especially at the apex, and slight friction may be detected here and there over the whole of the right side. Under the left clavicle, inspiration somewhat exaggerated in tone, but the breath sounds everywhere normal. He looks pale and thin. There is severe cough, with mucous expectoration, but the appetite is good, and there is, on the whole, a marked improvement in his general appearance. Impulse of the heart and loud blowing murmur at the base still present. Wound in the thigh nearly healed."

He continued to do well after his admission into the house. The cough rapidly diminished, and at length was only present in the morning on waking. His bodily functions were in every respect perfectly well performed. The wound in the thigh cicatrised, and were it not for the cardiac disease, this lad might have been considered in robust health. The following is the result of a careful examination of the chest, made December 23, 1851:—"On percussion, slight dulness under the right clavicle. On auscultation, inspiratory murmur somewhat harsh under both clavicles, but most so on right side. The vocal resonance also is slightly exaggerated over the apex on right side. In every other respect, the lungs appear to be healthy. There is great impulse of the heart still, and over the apex there is heard, with the second sound, a blowing murmur, which is very loud at the base."

I am not acquainted with any recorded case which, throughout its progress, has been examined with more care, in which phthisis in its last stage was more unequivocally manifested, and which was more decidedly the subject of a thorough cure, than the one above noticed. The lad was under my observation thirty months, and during twenty of these months he had been in the Clinical Ward, repeatedly examined by three winter and two summer classes, as well as by my professorial colleagues. Of the facts, and accuracy of the record in the ward-book, there can be no doubt; and it is equally certain that we watched the arrest of tubercular condensation

at the apex of the left lung, and the cicatrization of a tubercular excavation in the apex of the right lung. Moreover, a careful perusal of the case will show that this result was not brought about by the mere spontaneous efforts of nature. On the contrary, great difficulties had to be surmounted, numerous symptoms removed, and most important complications guarded against. Indeed, the effects of treatment could never be more unequivocally manifested in any case than they have been in this. On admission, he presented the wasting characters of the disease in its last stage. The emaciation was extreme; the cough and sweating most distressing; and the physical signs demonstrated a cavity as large as the fist in the right lung. Under the use of the oil his strength rallied. After a time it was given up, on account of his becoming so fat. Gurgling râles, and other signs of softened exudation, however, once more became apparent, and again disappeared when the use of the oil was resumed. He continued to take it from time to time until the cavity had completely healed.

During no part of the time this boy was under treatment did he experience any difficulty in taking the oil. On the contrary, it occasioned no uneasiness in the stomach, and was readily digested, and this although ordinary food was at one period frequently vomited, owing apparently to the violence of the cough. Its influence on his general health was most remarkable, as well as upon the local disease in the lungs. From a state of extreme emaciation, he became so stout that it was feared the oil would occasion obesity. It was also observed, that during its suspension the pulmonary symptoms returned, and that these, on again resuming the use of the remedy, once more disappeared. His appetite was always good—a circumstance that, from what has been previously stated, may easily be understood to have greatly facilitated the treatment, and contrasts strongly with the difficulties experienced in Case XV.

The following cases are illustrative of the advantage of the treatment previously recommended, but their histories, for the sake of brevity, are more condensed:—

CASE XVII.—*Hereditary Pulmonary Tuberculosis; Condensation with Softening of the Upper Lobe of Right Lung, and Slight Affection of Left Lung in 1843; All the Phthisical Symptoms, with Hemoptysis, continued to 1847; Then marked good Effect of Cod-Liver Oil; Complete and Permanent Recovery in 1850; Health continues good, 1853.*

Mr B., whose father had died consumptive, first asked my advice in the spring of 1843, being at that time seventeen years of age. He was tall and thin, of sallow complexion, and had long been troubled with severe cough and expectoration, want of appetite, weakness, sweating, and indeed all the symptoms of advanced phthisis. On examining his chest, I found marked dulness on percussion, with loud mucous and crepitant rattles, with bronchophony over the upper third of the lung on the right side. The left side, with the exception of slight harshness during inspiration at the apex, was healthy. I recommended attention to the diet, which was to be nutritive, moderate exercise, counter-irritation, and cod-liver oil. I did not attend this gentleman regularly, although I had frequent opportunities of seeing him, as he shortly afterwards commenced the study of medicine in this University. I ascertained, however, that he never attempted at that time to take the oil, as he had an unconquerable loathing for all fatty substances, but that by means of exercise, nourishing food, and counter-irritation, his health was somewhat improved. He continued alternately better and worse for the next four years, pursuing his medical studies, the appetite being always defective, and occasionally sweating profusely. This latter symptom caused him great distress during his attendance on the botanical class in the year 1846. In the summer of 1847, being much worse, he sent for me, and I found him greatly prostrated, with copious expectoration, tinged with blood, most abundant in the morning. The dulness on the right side was still present, and there was loud mucous rattle, mingled with creaking friction noises. The left side was tolerably healthy. I again strongly recommended cod-liver oil, and shortly afterwards he commenced taking it, at first in small doses, which

he rapidly increased to several tablespoonfuls in the day. From this time his health improved rapidly. In November 1847, he called upon me, and I ascertained that all moist rattles had disappeared, and were replaced by dry blowing sounds under the right clavicle. The loud bronchophony continued. He could now, however, take long walks, and was enabled to sing for a considerable time without fatigue, as he had a good bass voice. One day about this time, he spat up a calcareous concretion from the lung, the size of a small pea. In 1848 he commenced teaching medicine as a private tutor, an occupation he pursued for the next four years, occasionally undergoing great fatigue, and often being engaged from morning to night. His health, however, continued to improve; and he always found the oil act as a stimulus to him, creating an appetite, and greatly invigorating his bodily powers. In 1852 he might be said to have been thoroughly well for two years. He now obtained a commission as assistant-surgeon in the army, and after a short residence in London and Chatham, where he was considered as in perfect health by all his companions, he joined his regiment in Cephalonia in the autumn of that year. A letter received by his friends (September 9, 1853), informs them that his health is excellent, and that his old complaint seems to have completely left him.

This case is highly illustrative of the value of cod-liver oil. When in 1843, I first recommended the patient to take this remedy, it did not possess so much of the confidence of the profession as it subsequently acquired. Indeed, about that time it was openly ridiculed by many of those who are now its warmest partisans. It so happened that Mr B., himself a medical student, and closely connected with medical men, was induced to put no faith in its good effects, and refused to try it for upwards of three years. Its reputation having in the meantime extended, it was in 1847 that he was, for the first time, induced to take the oil, and as stated in the case, with the most beneficial results. It is worthy of remark that whilst during the four years previous to his taking it, the disease

steadily though slowly progressed; on the contrary, during the three years which followed, he gradually became restored to perfect health. It is, I presume, impossible to cite any single case more illustrative of the advantages of this substance. His own convictions as to its value were as strong as possible, and the remark he made as to the stimulating and invigorating powers of a single dose, especially of the brown oil, I have frequently heard dwelt upon by many other patients.

CASE XVIII.—*Tubercular Deposition, and Ulceration in the Summit of Right Lung, with the usual Symptoms of Phthisis in 1843; Arrestment of the Disease in 1844; Complete Recovery, but with slight Emphysema; Health good at present, 1853.*

Mr B., æt. 35, a superintendent of chemical works, consulted me in 1843, labouring under cough, difficulty of breathing, slight purulent expectoration, and increasing weakness and emaciation. On examining his chest, I found on percussion, marked dulness under the right clavicle, and on auscultation a sub-mucous râle, with the inspiratory murmur, prolonged expiration with sibilant râle, friction sounds, and bronchophony. The left lung was healthy. He was ordered to take a table-spoonful of cod-liver oil three times a day, and apply counter-irritation under the right clavicle. He continued his employment, took the oil regularly, and soon observed a marked improvement in his health. He took the oil uninterruptedly for nine months. Afterwards there was occasional diarrhœa, and every now and then a return of the cough and shooting pains in the chest. He had, however, been enabled to continue his employment, and felt satisfied that the oil had been of the utmost service to him. In 1850 he informed me that he sometimes experienced a sense of constriction at the upper part of right lung, and felt breathlessness on ascending a stair or making any unusual exertion. The slightest amount of free chlorine in chloroform brought on a paroxysm of cough. On percussion there was only slight dulness under the right clavicle, but marked increase of vocal resonance. He was robust, and with the exception of the occasional asthma alluded to, in perfect health. I examined his chest, Sep-

tember 6th, 1853, and found slight comparative dulness under the right clavicle, diminution of inspiratory, with prolongation of expiratory murmur. The breathlessness on taking exertion continues, and is also excited by the fumes generated during the preparation of morphia. In other respects his health was good.

CASE XIX.—*Advanced Pulmonary Tuberculosis; Cavity in the Apex of Right Lung, with the usual Symptoms of Phthisis in 1844; Recovery, Arrestment of the Disease, and Slight Emphysema, in 1846.*

Robert Kerr, æt. 22, entered the Royal Infirmary, August 1844, in a state of extreme emaciation. Such was his weakness that he could not stand without support. The disease was of at least two and a half years' standing. He has been more or less addicted to drink. The appetite had been uniformly bad, and there was often great thirst and occasional hæmoptysis and diarrhœa. There was profuse sweating at night, hollow suffocative cough, copious purulent expectoration, and great dyspnœa. On percussion there was complete dulness under the right clavicle, and loud gurgling râle could be heard in the same situation, with perfect pectoriloquy. The left lung, was comparatively free, presenting slight tubular inspiration, prolonged expiration, and no increase of vocal resonance. He came under my care in November, the treatment having previously been directed to the relief of the cough, dyspnœa, diarrhœa, and other occasional symptoms. He was still excessively weak, with profuse sweatings at night, and copious purulent expectoration. The physical signs remained the same. He was now ordered a tablespoonful of cod-liver oil three times a day, which he took regularly for three months. Two weeks afterwards he was much better, and could stand without assistance. Tartar-emetic ointment was then ordered to be rubbed under the left clavicle, and counter-irritation was kept up for three weeks. Gradually the pectoriloquy merged into bronchophony, the gurgling râle disappeared, and was replaced by dry, hoarse, and blowing sounds. The expectoration diminished, the night sweats ceased, the patient became evidently more robust, and during the

whole of the third month that he remained under my care he considered himself quite well. It so happened at this time that numerous cases required admission, and I found one morning (January 15, 1845), that he had been dismissed by the visiting Committee of Management, as no longer being a fit object for the charity.

I lost sight of this man for eighteen months; but one day, in June 1846, I met him on the South Bridge, looking remarkably well. He told me that he had continued taking the oil for several months after leaving the Infirmary, and had obtained employment as a labourer on the North British Railway, where he was then employed. I took him into a common stair and examined his chest. On percussion there was still marked dullness on the left side, under the clavicle. On auscultation, there was very feeble respiratory murmurs, with occasional friction sounds at the apex; but a little lower down the breath-sound was loud and the expiration prolonged. He stated that on going up a hill or a flight of stairs great breathlessness was excited, but that in every other respect he was in good health.

CASE XX.—*Tubercular Deposition and Ulceration in the Summit of Right Lung, with the usual Symptoms of Phthisis in 1844; Recovery, and Arrestment of the Disease in 1845.*

Louisa —, æt. 22, a milliner, applied at the Royal Dispensary with the usual symptoms of phthisis in its advanced stage, in the summer of 1844. At the apex of the left lung, there was dullness on percussion, loud mucous râle, and bronchophony. The right lung was tolerably free of disease. For the last six months she had obtained very little work, and her food was deficient both in quantity and quality. Indeed she lived almost entirely upon dry bread and a little tea. A tablespoonful of cod-liver oil was ordered to be taken three times a day. She attended at the Dispensary two or three weeks, and, as the oil caused no nausea or sickness, four tablespoonfuls were ordered to be taken daily. I lost sight of this girl for twelve months; but she again applied at the Dispensary, in the summer of 1845, labouring under a slight bronchitic cough which she had contracted a few days previously. Her

appearance was so improved that I did not recognise her; but she told me that she had taken the oil continuously for nine months, on account of the great benefit it had produced. Gradually all her symptoms had disappeared; she became stout and strong; and now considered herself in perfect health. On percussion all dulness had disappeared; and on auscultation, with the exception of prolonged expiration and occasional sibilant râle, nothing unusual could be heard. I was so struck with the perfect disappearance of the disease, that I called in my colleague, Dr Spittal, who was receiving patients in another room, to confirm the absence of the physical signs characteristic of tubercular softening, which he did.

There could be no doubt as to the existence of softened tubercle in the apex of the left lung in 1844, nor of its disappearance in 1845. At both periods the girl was repeatedly and carefully examined, not only by myself, but by from six to twelve gentlemen, who constituted my poly-clinical class; and on both occasions she was the subject of lecture.

In the six last cases related, I consider that there was a permanent arrestment of phthisis pulmonalis in its advanced stage. In Cases XV., XVI., and XIX., there were distinct cavities; in Cases XVII., XVIII., and XX., the tubercle had softened, and probably occasioned small anfractuous cavities—but this cannot be determined. In Cases XV., XVIII., and XIX., the healing was followed by permanent dulness, more or less consolidation of the apex of the lung, and dense adhesions between the pleuræ covering the diseased part. In Cases XVI. and XX. the lesion probably produced a fibrous cicatrix, without adhesion or great condensation; and hence the inconsiderable dulness and vocal resonance afterwards. In Cases XVIII. and XIX. the recovery was accompanied by an emphysematous condition of the lung—a frequent accompaniment of cicatrization in part of the pulmonary tissue. That the arrestment may be ascribed to art, and was not spontaneous in these cases, will, I think, be evident from studying the facts they presented. In all of them, improvement was contemporaneous with the period

when cod-liver oil was digested, and rendered assimilable to the wants of the economy, and in this respect they confirm the views I have put forth with regard to the mode in which the remedy operates.

It must not be supposed, however, that cod-liver oil is the only means of producing this result, although, for the reasons previously given, I believe it possesses greater power as an analeptic than all others. As formerly stated, anything that will rouse the nutritive functions, whether it be improved diet, change of occupation, exercise, or even tonic remedies, that improve the appetite, may, in particular cases, be shown to produce a similar effect. As an illustration of this, I may cite two, out of a considerable number of instances which have been furnished me by my medical brethren, both treated before cod-liver oil came into use. The first case I myself examined when in Birmingham, during the autumn of 1849, owing to the kindness of Dr Evans, whose history of it, written in 1850, I give entire.

CASE XXI.—*Pulmonary Tuberculosis, with Tubercular Consolidation and Softening at the Apex of Right Lung; All the Symptoms of Phthisis, with Hemoptysis, 1835; Arrestment of the Disease in 1837; No Return of Pulmonary Disease up to 1853.*

“Mr W., æt. 24, a draper, of dark complexion, black hair, and stout frame, had always enjoyed good health until the beginning of March 1836, when he was seized with pain in the right side, attended with a troublesome cough, and expectoration of yellow mucus, occasionally streaked with blood. These symptoms were succeeded by night fever and morning perspirations, and continued until I was requested to meet his surgeon in consultation, on the 25th of June, in consequence of an alarming attack of hemoptysis.

“June 25, 1836.—He was considerably reduced in flesh and strength. He had this morning expectorated about a pint of florid blood. Pulse 100, feeble; tongue loaded; bowels confined. I found, on percussion, decided dulness under the right

clavicle; on auscultation, rather loud mucous râle during inspiration, and expiration prolonged. Percussion clear, and respiratory murmur natural, over the posterior and inferior parts of the right side. The hemoptysis having subsided, on the 1st of July he was enabled to visit his native air in Derbyshire, where he continued until the middle of October.

"October 16.—On his return home he was much emaciated. He had still a troublesome cough, greenish-yellow mucous expectoration, which, during his absence, had been occasionally streaked with blood; evening fever and morning perspiration. Dulness on percussion of the right clavicle, and beneath it, and on auscultation a loud mucous râle in the same region.

"I considered the case to be a well-marked example of phthisis; and as all his symptoms had become progressively worse since he left home in July, I represented to his friends the danger of his case, and advised him to relinquish his business.

"During the succeeding winter Mr W. remained in Birmingham, and was confined to the house in rooms of uniform temperature. Mild tonics, consisting of the different preparations of iron, and decoct. sarsæ., etc., were given, and a nutritive plan of diet observed; and, with exception of a few interruptions to his progress, he gradually improved. In February 1837, he had increased in weight and strength, and in the middle of June he had so far recovered that he was enabled to resume his business.

"During the last thirteen years Mr W. has been liable to a cough in the winter, but during the summer he has usually been free from cough.

"At present Mr W. is perfectly well. He is stout and rather corpulent; and weighs upwards of thirteen stone. On examining his chest to-day (August 10, 1850), on percussion the right clavicle is slightly duller than the left. On auscultation the respiration is rather coarse, expiration prolonged, without any moist râle beneath the right clavicle.

"There exists no tendency to phthisis in Mr W.'s family—his father is still alive—his mother died of acute disease—he has several brothers and sisters living."

In a note I received from Dr Evans, dated June 18th, 1853, in reply to interrogatories directed to ascertain the nature of his diet during the winter of 1836, as well as his then condition, he says,—“Mr W.’s recovery followed a mild and nutritive plan of diet, consisting of milk and light animal food, but fat, etc., did not constitute an essential part of his diet.

“I have been consulted by him on several occasions since your visit to Birmingham, in consequence of hepatic and gastric symptoms, caused by excess in eating and drinking, and to the latter habit he has been addicted for several years. He is at present thinner than he was when you saw him; but he has had no return of the pulmonary symptoms. The loss of flesh is, I believe, to be attributed to his habit of taking stimulants.”

Here, then, is a case of advanced phthisis, arrested in the spring of 1837, and continuing well up to the present time, a period of sixteen years. Although fat, it is said, did not constitute an essential part of his diet, it must be evident that during the winter and spring of 1836–7, the nutritive functions were improved by the hygienic and medical treatment employed. The emaciation visible in October of the former year, disappeared in the February following, when he increased in weight and strength, and under this improved constitutional state the pulmonary disease was arrested and has never since returned.

The following case, that of a medical man, written by himself, was sent to me by Dr Corrigan, who, in a note dated September 17, 1850, says of it, “Of Dr F.’s case I can have no hesitation in making a positive assertion. I never had clearer evidence of the existence of a cavity, than in my examination of his chest, when I saw him in 1840. He is now, as you will see, in rude health, in charge of a dispensary district, as its medical officer, in one of the mildest parts of Ireland.”

CASE XXII.—*Pulmonary Tuberculosis, with a Cavity in the Apex of Left Lung; All the Symptoms of Phthisis, with*

Hemoptysis, in 1840; Permanent Arrestment and Recovery in Fourteen Months; Health reported good by himself in 1850.

“July 2d, 1850.

“MY DEAR DOCTOR,—I received your note, and as I am indebted to you for my life (under God), the least I can do is to remind you of the means you used to preserve it. In the end of May 1840, I got ill, and was treated for fever, though I think myself it was inflammation of the lung. I had great pain on the top of the left one, and behind, under the shoulder. I wanted them to bleed, leech, or blister me, but they would not. I got well, however, and went twenty-five miles inland for a fortnight. On my return the cough which had attended the latter part of my illness and convalescence increased, and one morning I spat up a quantity of blood. I was then blistered and leeches; got first acid sulph., then prussic. I had night-sweats and lost flesh. In fact I was a regular shadow. Had three returns of bloody expectoration at intervals of about ten days, being in the intervals purulent. In this way I continued till about the middle of September, when having been informed that three of my four medical attendants had not given me a very long day, to wit, a month, I started for Dublin by easy stages. On my arrival, Mrs F. called on you to know what time I would find you at home; but you most kindly insisted on coming to me, which you did next day, examined, and ordered me 20 gr. tart. of iron, three times a day, with four leeches to my chest. Having inquired into my habits, and finding that I took *three or four* glasses of punch every night previous to my illness, you ordered me a glass of porter and broiled meat about three every day. I improved, had no bad symptoms; but after a few days you put a seton in my chest, under the left clavicle. You also ordered me wear flannel instead of cotton. Dr Stokes saw me after, both at his own and your house. I continued the tart. of iron for about six months; the seton wore out in about nine. I had another put in, which I wore for about five months, putting on, now and then, a very small blister or two leeches. I gave them all up about fourteen

months after I put myself under your care, and have never since, thank God, had one moment's sickness, nor have I taken a grain of medicine of any kind, except while taking the tart. of iron, for ten years. I have lots to do, must ride or drive nine miles every day, and after all this work I am *twelve stone four* this day. If I have forgotten anything you will let me know, and always believe me to remain, my dear Dr,

"Most faithfully and sincerely yours,

"C. F.

"Dr Corrigan."

In this, as in the last case, iron was given as a tonic; but I have written to little purpose if it be not evident to the reader that the generous diet, the porter and broiled meat, in short, the improved treatment, assisted perhaps by the change of scene, confidence, hope, and all those circumstances which tend to renovate the nutritive functions in a debilitated constitution, were the real cause of the improvement. Here, also, the recovery was permanent.

I could easily cite a greater number of similar cases, but as they only exhibit the same fact, and indicate the advantage of the analeptic treatment in procuring permanent arrestment of pulmonary tuberculosis, even in its most advanced stage, nothing could be gained by doing so.

Our ideas with regard to the good effects of treatment, however, would be very limited, if we confined our observation merely to such cases as could be shown to have undergone a permanent cure. Such is the difficulty of following the progress of these cases, that they must always be limited in number. I am disposed, however, to believe, that the more extended our knowledge of the pathology and diagnosis of phthisis becomes, and the more generally a treatment, founded on the principles I am contending for, is adopted, the more they will increase in number. But the advantage of an analeptic treatment may be observed in most cases of phthisis, although a permanent cure is not attained. Life may certainly be prolonged, and the distressing symptoms greatly ameliorated. No doubt it will always

be difficult to ascertain how much of the benefit is to be attributed to art, and how much to nature ; but when we ascribe an analeptic power to an oleaginous substance, and find, on its administration, that the nourishment of the individual is improved, that his strength augments, and a check is given to the disease, our faith in the remedy increases the more frequently these circumstances are witnessed.

I could give a great number of cases observed in private, dispensary, and hospital practice, in which the apparent good effects of the treatment were extraordinary, but in which either the termination of the case is unknown, or where the disease ultimately proved fatal. The following are instances of this :

CASE XXIII.—Agnes M'Laren, married, æt. 45, admitted into the clinical ward, No. 12, of the Infirmary, November 22, 1844, has suffered from ill health and occasional cough for the last four years at least. This is the fifth time she has been in the house, from which she has always been discharged as relieved, after a treatment varying from two to four months in extent, and consisting, in addition to cough mixtures, anodynes, antispasmodics, astringents, etc., of good diet. At home, lives principally on a little tea and dry bread, with potatoes or porridge for dinner. About once a week she has broth or a little meat. On admission, a large cavity was detected in the apex of the left lung, and there were signs of crude tubercle in the apex of right lung. There was great emaciation, considerable sweating, purulent expectoration, and occasional diarrhoea and hemoptysis. She remained in the house four months and a half, having been treated with cod-liver oil, counter-irritation to the chest, and good diet. She was dismissed April 10th, at her own request ; on which day the report is as follows :—"Dulness under left clavicle ; dry blowing murmurs in this situation, both with inspiration and expiration, which have been present without change for at least two months. Cough and expectoration trifling. General health good. She says she has not been so strong for the last five years."

In the course of a few months this woman applied at the

Royal Dispensary, with the cavity full of pus, and a return of the emaciation and weakness. She was treated with cod-liver oil, but was unable to procure good diet. She again entered the Infirmary, and during the next three years she was alternately getting better in the house, and worse at home. I saw her for the last time at the Dispensary in 1848, when the cavity was evidently much contracted. The conclusion of the case is unknown.

CASE XXIV.—Jane Maitland, *æt.* 30. This woman had a considerable cavity in the apex of the left lung, with loud gurgling, and perfect pectoriloquy. Between the years 1842 and 1847, she had been in the Infirmary, under different physicians, at least seven times, and probably oftener. Her history is almost the same as the last, with the exception that she was never so much emaciated, and only felt great weakness; always getting worse on the bad diet she had at home, and as regularly getting better during her residence in the Infirmary. The termination of her case is also unknown.

It has always appeared to me that cases of this kind not only exhibit the best proofs of the advantage of treatment, but of the causes which induce and keep up the disease—the benefit invariably corresponding with the residence in the Infirmary, and the disorder becoming worse when, on going out, the patients were exposed to hardships and bad living.

I have confined my illustrations of the treatment of phthisis to well-marked cases, in which it was far advanced, and I think that the facts recorded hold out to us great encouragement in the future management of this formidable disease. In the early stages this is not so difficult, and it is comparatively much more successful; not, indeed, that even then it is always easy to overcome the dyspepsia and other causes which tend to produce and keep up the disorder. When the stomach is deranged, it often requires a variety of remedies to counteract its irritability and acidity, before nutritive substances can be taken. In other instances, however, especially when it exists in the half-starved poor, food is taken readily, and then

amendment is generally soon observed. The following case is a good illustration of that form of phthisis so frequently met with in practice, in which the appetite is defective:—

CASE XXV.—*Advanced Pulmonary Tuberculosis; Great difficulty in introducing Nourishment, but when at length Cod-liver Oil was assimilated, marked Improvement; Death from want of perseverance in remedial measures.*

Jane Hamilton, a dressmaker, æt. 18, admitted into the Royal Infirmary, September 12, 1849. She stated that last April her general health began to fail; the appetite was bad; cough with expectoration came on; cold sweats appeared on the face, hands, and feet; the catamenia, which had never been very regular, were suppressed; and she became so weak that she could not stand. Since then there has been a temporary improvement; but for some time back she has again become worse.

On admission, she was pale and emaciated, and so weak that she was unable to sit up above a few minutes at a time. There was copious perspiration during sleep, a severe cough, with abundant yellowish viscid sputa—no pain in the chest, which was well formed externally. The tongue was covered with a brown fur; appetite capricious and bad; bowels open every second day. The treatment consisted of tonics, expectorants, and counter-irritation to the chest, which produced considerable amendment. I took charge of the case in the middle of *October*, and found, on careful percussion, dulness below the right clavicle, with loud mucous râle over the upper third of right chest. There were also sonorous and sibilant râles over the greater part of both lungs, anteriorly and posteriorly. By means of expectorants and counter-irritants, the bronchitic symptoms and signs were subdued by the *1st of November*; but the dulness and moist râles under the right clavicle still continued. *A tablespoonful of cod-liver oil was then ordered to be taken three times a day.* The remedy was suspended on the 8th, on account of a febrile attack she then experienced, which was ushered in with headach and rigors, and accompanied with accelerated but soft pulse, heat of skin, loss of appetite, frequent nausea and vomiting, and consider-

able spinal irritation. It was not until November 30th that these symptoms were so far removed, and the tone of the stomach augmented—by means first of antimonials, and subsequently of naphtha, alkalies, vegetable bitters, and stimulants—that the oil was again ordered. It produced considerable nausea, however, so that, after persevering in its use for ten days, it was again suspended. It was once more had recourse to on the 14th of December, and was readily retained on the stomach. A few days subsequently the dose was increased to four tablespoonfuls daily. *December 30.*—The report to-day is—"A very evident improvement in the general health. Her strength is so far increased that she sits up a considerable portion of the day. The perspirations have nearly disappeared. The expectoration is still thick and purulent, but not so copious. She is evidently much stouter, and the skin is of a more healthy colour. The catamenia have also reappeared. There is still dulness under the right clavicle on percussion. The coarse moist râle has disappeared, and a fine crepitating murmur only is heard with the inspiration towards the acromial end of the clavicle. There is prolonged inspiration, and increased vocal resonance." From this time she continued to improve. On the 1st of January the oil was reduced to three tablespoonfuls daily. A small blister was occasionally applied to the upper part of right chest anteriorly, and an expectorant mixture given to facilitate the expectoration, which, though diminished in quantity, retained its viscid and purulent character. On the 30th of January the inspiratory murmur had acquired a certain degree of harshness, but here and there very fine crepitation could still be detected. Notwithstanding my earnest advice to the contrary, she insisted on leaving the Infirmary, and did so February 24th.

She called at my house on the 7th of March, when I examined the chest carefully. There was still dulness, but not so marked as formerly, under the right clavicle; no crepitation on auscultation, but harshness of the inspiratory murmur, prolonged expiration, some friction noises, and increased vocal resonance. She was stout, of healthy appearance, and expressed herself as being quite well; but the expectoration of

purulent matter still continued to a slight degree, with occasional cough. Shortly afterwards, she went to Dundee to carry on her occupation as a milliner, where the confinement, late hours, and irregular food, soon caused a return of her more urgent symptoms. She again entered the Infirmary, and once more, after a few months, she was dismissed relieved. On the last occasion, she was admitted August 19th, 1852, the disease having progressed to its last stage during the interval. She died September 8th.

In some particulars, this case may very instructively be contrasted with several others in which the loss of appetite, and difficulty of nourishing the system, were not so well marked. Suppose, for instance, we compare it with that of the boy Barclay (Case XVI.), although the local disease had not proceeded so far. The physical signs in the girl exhibited at most bronchitis, with softening of the tubercular exudation at the apex of the right lung, whereas in the boy they demonstrated that a large cavity existed in one lung, whilst the other was also affected. There was the same general prostration, however, and the same emaciation, excessive weakness, profuse perspiration, purulent expectoration, and distressing cough. But there was this difference in the antecedent circumstances of the two cases—namely, that the boy had a good appetite, but had been subjected to an insufficient diet, whilst the girl had no appetite, but possessed the means of gratifying it. In the first case, nutrition was affected from food being in deficient quantity, the digestive organs being tolerably healthy; in the second, it was brought about on account of the dyspepsia and disordered state of the stomach rendering it impossible that a sufficient quantity could be consumed. The result in both was the same—namely, impoverishment of the blood, and tubercular exudation into the pulmonary organs.

The practical management of these two cases was considerably modified by the circumstances to which I have just alluded. In the boy, there was no difficulty in overcoming the imperfect nutrition. We have seen that he took the cod-liver oil, and digested it and his food with the greatest facility.

In the girl, all thoughts of food caused disgust, and the cod-liver oil produced nausea, and for some time could not be tolerated. For a considerable period, therefore, my exertions in the treatment of this case may be considered as preparatory to the diminution of the phthisical symptoms, and directed to the removal of those complications which prevented any successful attack on the more important disease.

Thus my first efforts were directed to removing the bronchitis, which was accomplished by means of expectorants and counter-irritants. Cod-liver oil was then ordered, but it occasioned nausea, and was suspended on account of a febrile attack she now experienced. On her recovery from this, the nausea, vomiting, and dyspeptic symptoms were treated by means of naphtha, alkalies, vegetable bitters, and carminatives, with apparent success; but, on recurring to the oil, they again returned; so that, after persevering for ten days, it became again necessary to give up its employment. In a few days, however, it was once more tried, and on this occasion with success. It was taken readily, a marked amendment followed; the dose was increased to four tablespoonfuls daily, and it was astonishing to see how rapidly she improved. Her strength increased, the emaciation and cachectic look disappeared, the skin assumed a healthy colour, and she became positively stout and fat, so that she was scarcely recognisable. The cough almost ceased, the expectoration greatly diminished, the perspirations did not appear at night, the catamenia returned, she sat up the entire day, and at length considered herself so well, that, on being allowed to leave the hospital for a day, she did not return. She called on me a few days afterwards, when I found that, although the constitutional symptoms had almost entirely disappeared, and her general health might be called good, traces of the local disease were still apparent, as stated in the report. This case, therefore, exhibits the obstacles which the physician has not unfrequently to overcome before he can carry out that line of treatment by means of which the abnormal nutrition is to be obviated, and the tubercular exudation checked; but it also inculcates the importance of perseverance, and exhibits the good effects which

may result from persisting in a treatment dictated by correct pathological principles. This girl, when her general health became better, insisted on going out of the Infirmary, when, once more exposed to her unhealthy occupation and bad diet, her symptoms returned; the disease, which had been arrested, again made progress, and she died. But there is every reason to suppose that, if she could have been retained in the house as the boy Barclay was (Case XVI.), that then, as in him, the disease might have terminated in a perfect recovery.

The foregoing cases serve to illustrate the occasional success, as well as the difficulties and causes of failure, which attend the treatment of pulmonary tuberculosis. These latter, from being known, will serve to point out where the efforts of medical men should be directed, and how art may be brought to operate with the greatest effect. Nothing seems to have been better demonstrated from the past history of medicine, than that empirical rules and practice (understanding by empirical mere experience) have had little influence in checking the mortality of phthisis. It is to be hoped that principles founded on a correct pathology, and a practice directed to improving the nutritive functions, rather than the palliation of leading symptoms, may be attended with better success. For my own part, I feel convinced that the doctrines advanced in the foregoing pages are founded on truth, and that their recognition will commence the fulfilment of a prediction made by Dr Stokes, of Dublin, in the following words:—"There can be no doubt that, as medicine advances, the cure of consumption will be much more frequent; its nature will be better understood, its first stages more commonly recognised, and the disease prevented from proceeding to incurable disorganisation."¹

It ought not to be supposed, however, that this most fatal and dreaded disorder, when far advanced, is capable, under the best system of treatment, of being permanently arrested in the majority of cases. Every morbid anatomist who knows

¹ Stokes on Diseases of the Lungs, p. 438. 1837.

the destruction of the tissues involved, and every pathologist acquainted with the progress and protracting character of the disease, must share this opinion. It should be remembered that it is only within the last eight or nine years that the spontaneous arrestment of pulmonary tuberculosis has been generally admitted by the profession, and that this has been established rather by the evidence of morbid anatomy than by the flattering accounts of individual practitioners. In all the cases previously given, upwards of twelve months have been required to produce the good result described, and many practitioners, who still believe the disease to be invariably fatal, argue that it may return in periods varying from fifteen to thirty years. As the experience of cod-liver oil and of an analeptic treatment does not extend, in this country, farther back than twelve years, this objection cannot as yet be met, although isolated facts incontrovertibly demonstrate (such as that described p. 37) that the pulmonary ulceration has been completely healed. I shall continue to watch the cases already recorded, as well as many others which have for a shorter period been under my observation, with a view to a further contribution to the pathology and treatment of this disease.

The chief danger now to be apprehended, is that many members of the profession, from a state of hopelessness with regard to pulmonary tuberculosis, will run into the opposite extreme, and that we shall be inundated with successful cures of consumption. I have already met with instances where the positive assertions of the medical practitioner have not been warranted either by his diagnostic powers, or by the rapidly good effects of his practice. On the whole, however, I believe that the errors of diagnosis and of a sanguine disposition in this respect, will be more advantageous to the public at large, than those which have so long prevailed in connection with the supposed necessary fatality of the disease, and that a general adoption of the nutritive plan of treatment will be followed by better results, than that which characterised the old palliative system.

CHAPTER IV.

OBSERVATIONS ON THE USE OF LOCAL APPLICATIONS TO THE PHARYNGEAL AND LARYNGEAL DISEASES WHICH ARE FREQUENTLY MISTAKEN FOR, OR ASSOCIATED WITH, PULMONARY TUBERCULOSIS.

To enter upon the pathology and treatment of the numerous diseases which may be complicated with pulmonary tuberculosis, would be to write a work on most of the disorders to which the various textures and viscera of the body are subject. The treatment of the symptoms they occasion has been already alluded to. In this place, I propose to confine my remarks to the laryngeal and pharyngeal affections which are so commonly associated with phthisis, and to which many of those symptoms generally attributed to the pulmonary lesion are not unfrequently owing. My attention was first directed to this subject by the following case :—

CASE I.—On the 11th December 1849, Captain B. entered my room, to consult me regarding an occasional expectoration of blood, which caused him, but more especially his lady, much anxiety. He was a tall vigorous looking man, between thirty and forty years of age, who had no cough or any complaint whatever, but from time to time had hawked up a small clot of blood about the size of a pea. On a few other occasions, he had observed some mucous expectoration tinged or streaked with blood. His chest was finely developed, and its most careful examination failed to elicit anything abnormal.

His appetite and digestive functions were excellent; and, as commandant of a depot in the neighbourhood of Edinburgh, he had never experienced uneasiness from his professional duties. After repeated examination, I had no hesitation in stating that the lungs and large vessels were perfectly healthy, and that I hoped the expectoration of blood would cease spontaneously.

The origin of the blood in this case appeared to me at that time to be very mysterious. It was not florid. There was no reason to suppose it to be of pulmonary origin. There was nothing in his voice to indicate laryngeal disease. I did not examine the pharynx, not being then aware of the importance which ought to be attached to it. I was consequently left in great doubt as to the origin of the blood, and of the best means of removing anxiety from my patient. My uncertainty, however, was partly dispelled by the following case:—

CASE II.—I was requested by an assurance office, in July 1850, to examine the chest of Mr M., a merchant, aged about 30, who said he laboured under no kind of complaint, with the exception of occasional sore throat, and expectoration of mucus tinged with blood. He was tolerably stout, took long walks without uneasiness, and suffered from no difficulty of respiration or from cough. Repeated examination of his chest failed to elicit any physical sign indicative of pulmonary disease. I therefore certified that his lungs were healthy. In October 1851, this gentleman called upon me again for advice, under the following circumstances. The soreness of the throat had latterly increased, and considerable cough was induced, after which he spit up mouthfuls of purulent matter, frequently tinged of a red colour. He brought me some of this sputum to examine, which consisted of mixed blood and pus, of a dirty brick-red colour. Examination of his chest again convinced me that the lungs were unaffected; but in the interval I had paid attention to the writings and practice of Dr Horace Green, of New York; and I now examined his

throat, when the cause of his symptoms was at once apparent. The fauces and upper part of the pharynx were studded over with nodular swellings, varying in size from a pin head to that of a pea. Many of them were bright red and fungoid in character, probably the origin of the extravasated blood, whilst considerable patches of purulent matter adhered to several parts of the mucous membrane. I applied a sponge, saturated with a strong solution of the nitrate of silver, to the affected parts. In three days he returned, having been much relieved, when the application was repeated. I have not seen him since.

These two cases convinced me that certain symptoms which have hitherto been considered as indicative of phthisis might have their origin entirely in the fauces, pharynx, and upper part of the larynx. The cough so occasioned, with the purulent expectoration, often tinged with blood, frequently so resembles that occasioned by phthisis, as not only to induce alarm in the minds of the patients, but frequently to mislead the medical practitioner. I have now met with many such cases, which have been mistaken for phthisis, and which have been treated for that disease without any effect, until local remedies were applied, when they, for the most part, disappeared, or became much better.

The following case illustrates still further the occasional similarity of laryngeal disease to phthisis pulmonalis, and the erroneous treatment to which error in diagnosis may lead.

CASE III.—Margaret D——, a staymaker, æt. 25, admitted to the Royal Infirmary, September 9, 1851, labouring under occasional vomiting, frequent cough with hæmoptysis, and copious purulent expectoration. There was considerable sweating at night, and her general health, owing to want of sleep and the harassing cough, was much broken down. At the commencement of the winter session in November, I found her taking an acid mixture to relieve the sweating, a cough mixture to diminish the cough, together with cod-liver oil. The chest had also been blistered. Careful percussion and

auscultation convinced me that the thoracic physical signs were perfectly normal. I then examined the fauces, which were covered with purulent mucus, but presenting here and there red and prominent follicles. The cough was also ascertained to be convulsive, the voice hoarse and broken, and, on placing the stethoscope over the larynx, a loud ringing sound accompanied the inspiration. From these facts I had no difficulty in diagnosing laryngitis; and on ascertaining that the woman was a prostitute, and addicted to drink, there could be little doubt that it was of syphilitic origin. The fauces were freely touched with a solution of nitrate of silver (3ss. to ʒj. of water). This was repeated on the following day, and on the next the upper part of the glottis was touched, causing severe convulsive cough. I subsequently passed the sponge, saturated with the solution, into the larynx every second or third day during the month of November, which at first caused very severe and prolonged convulsive cough, that gradually became somewhat diminished. On the whole, however, no great amendment was produced, although the expectoration and cough during the intervals were lessened. The local applications were then suspended, but it soon appeared that they had been beneficial in checking the symptoms, from their severity again increasing, especially the amount of expectoration streaked with blood, and the want of sleep at night, owing to the severity of the cough. In the second week of December, therefore, the topical applications were resumed, together with occasional blisters to the larynx, and once more a certain amount of benefit was obtained. But as this treatment, combined with the internal administration of iodide of potassium and bitter infusions, for a period of four weeks, seemed to produce no further improvement, she was dismissed on January 7, 1852.

In this case all the symptoms of phthisis pulmonalis were present, including emaciation, profuse sweating, cough, expectoration of pus mingled with blood, bad appetite, hectic; and in consequence, cod-liver oil, cough mixtures, acid drops, wine, and good diet were administered, and all without effect.

Indeed her appetite was so bad, that the diet was not taken, and nutrition suffered. When a careful examination of the chest enabled me to form a correct diagnosis, the treatment was changed. The cough and acid mixtures were abandoned, the stomach gradually regained its tone, her appearance slowly improved, and although, from necrosis of the ossified cartilages, the local disease was not removed, it was considerably benefited by topical applications.

CASE IV.—Miss G., æt. 26, had been treated by a homœopathic practitioner, for three years, who informed her that she was labouring under consumption, and at last advised her to go to Australia. Her friends, unwilling that this sentence of banishment should be carried out without further advice, brought her to me on the 19th of October 1852. I failed to discover the slightest disease of the lungs, either by percussion or auscultation. On the contrary, repeated examination convinced me that the inspiratory and expiratory murmurs both possessed their natural softness and duration. There was, however, frequent cough with copious purulent expectoration. She had had constant sore throat since her childhood, and was labouring, in addition, under headaches, loss of appetite, constipation, leucorrhœa, excessive menstruation, hemorrhoids, occasioning frequent hemorrhage, so that she presented the anemic appearance, with all the symptoms of confirmed chlorosis. When I informed her that her lungs were not diseased, and that her cough entirely depended on some affection of the throat, she would not believe me. She had so long been convinced that her case was one of consumption, and that nothing but a change of climate could be of any advantage to her, that I think it was with some reluctance she heard a different opinion advanced. To oblige her relations, however, she allowed me to apply the solution of nitrate of silver first to the fauces, and subsequently down the œsophagus. She then became convinced that there was a spot at the upper part of the throat which, when touched, gave rise to burning pain, induced severe spasms for a few moments, and subsequently left her free from cough, and un-

easiness. The applications were consequently continued every other day, and were conjoined with the internal administration of iron and vegetable bitters. Under this treatment she improved much in health. I soon perceived, on passing the sponge, that there was a constriction at the upper part of the œsophagus, the nature of which caused me considerable anxiety. The case, however, soon resolved itself into one of hysteria and spinal irritation, with all kinds of nervous symptoms, simulating in turn paralysis, spasms, uterine, abdominal, pulmonary, cardiac, and other painful functional disorders. She is now greatly relieved from these, and the pharyngeal disease has been completely removed.

Even when the lungs are decidedly tubercular, much of the cough and irritation may be owing to laryngeal complication, although, in the majority of cases, they are attributed to the pulmonary disease. I am satisfied that the constant cough and succussion of the chest so occasioned, increases, if it does not actually sometimes induce, pulmonary disease, especially the most common of all phthisical complications—bronchitis. I was very much struck with the amount of cough in the following case, which was removed by paying attention to the laryngeal complication.

CASE V.—Dr C———n, a medical man, about 25 years of age, had long suffered from delicate health, and latterly the fatigue of his practice, which necessitated long journeys on horseback, frequently in the middle of the night, had induced constant coughing and thoracic pain. He had found such remedies as cod-liver oil, expectorants, demulcents, and anodynes useless. On examining his chest, there was slight dullness on percussion under one clavicle, somewhat harsh inspiration, and prolonged expiration in the same situation, with a little increase of vocal resonance. The disease in this case was evidently incipient, and yet I noticed the violent suffocative cough, followed by expectoration of purulent mucus, and was struck with the evident disparity between the incipient pulmonary lesion and the advanced cough and expectoration.

This was explained by inspection of the fauces, which were red, rugous, and covered with patches of pus. Further, it was clear from the symptoms that the glottis was also affected. The local application, every alternate day, of a sponge saturated in a solution of nitrate of silver, was soon followed by the best results, and in a few weeks the cough entirely ceased, and with good diet he regained his general health, although the pulmonary signs remained unchanged.

The removal of the cough and expectoration in this case, although incipient phthisis was undoubtedly present, proves that the former were in no way caused by the latter, which continued to remain, notwithstanding the disappearance of his distressing symptoms. Expectorant and anodyne remedies in such cases are evidently useless and even injurious. Useless, because it cannot be supposed that squills, ipecacuanha, etc., by being introduced into the stomach, can act upon the follicular disease of the pharynx and larynx; and injurious, because these remedies, combined as they usually are, with opium, occasion nausea, derange the appetite, destroy the capacity of taking food, and thus cause that diminution of vigour in the patient, so favourable to the development of the pulmonary tubercular exudation. In the following instance, a better result was obtained.

CASE VI.—Dr B., æt. 34, a medical practitioner in the island of Surinam, applied to me, during a visit he made to this country, in June 1850. He had frequent cough and sore throat, with copious expectoration, increased by exposure to cold. There were also the usual symptoms of incipient phthisis. On examining his chest physically, I discovered comparative dulness under the right clavicle, slight crepitation with the inspiration, prolonged expiration, with marked increase of the vocal resonance; the left lung was healthy; the mucous membrane of the fauces was of a dark red colour, scattered over with prominent follicles. I applied the sponge first to the fauces, and afterwards introduced it into the larynx every second day, with evident benefit. He also took cod-liver

oil, with an alkaline and vegetable bitter mixture. In the autumn he returned to Surinam, and soon afterwards informed me by letter that his health was greatly improved. He again visited Edinburgh in August 1851. The throat had latterly again become troublesome, from exposure to the inclemency of the weather; but on examining the chest, although there was still slight dulness and increased vocal resonance under the right clavicle, all crepitation had disappeared. He spent the following winter at Sligo, and in the summer of 1852 commenced practice in a large village in Perthshire. Last month he again visited me, and asked if he could venture to propose the insurance of his life. On percussing the chest, no dulness could now be discovered, a mere shade of increased vocal resonance remained, and the breath sounds were perfectly natural. Under these circumstances I considered his phthisis to be arrested, and had no hesitation in sanctioning his application to an Edinburgh life insurance company, which at once admitted him without any extra premium. I am of opinion that the arrestment of the phthisis in this case was mainly due to the good effects of the applications applied to the pharynx and larynx, and that the diminution of irritation there, and the removal of the cough, enabled the exuded tubercle to become absorbed with more readiness than it would otherwise have done.

I might give a considerable number of cases in which laryngeal symptoms have been more or less mistaken for, or complicated with, phthisis, and which have been greatly benefited by a local treatment. At the same time, I need not say that there are a large number of cases in which no such complication exists, and that they must be judged of only by a careful auscultatory examination of the lungs and larynx, and by inspection of the pharynx. I have also had abundant opportunities of satisfying myself that many so-called cases of chronic bronchitis in persons of advanced life, are entirely owing to throat disease,—a point, however, which has been so ably illustrated by Dr Horace Green, that I need not dwell upon it here.

The propriety of local applications in cases of tubercular

ulceration of the glottis or larynx has in this country been much doubted, although highly recommended by Dr Horace Green. The following case, in which the larynx was greatly involved, has served to persuade me of its occasional benefit.

CASE VII.—Mr P., an advocate, spent the winter of 1851-2, at Torquay, and consulted me in March following. He was thirty-nine years of age, and told me, in a hoarse whisper, that for three or four winters previously he had suffered from cough, with discharge of matter from the nose. During the summer he was quite well. While resident in Devonshire he gradually lost his voice, and his medical attendant there had passed a sponge, saturated with a solution of nitrate of silver, every day,—a treatment, however, that had failed to arrest the aphonia, which, when I saw him, was complete. On examining his chest, I ascertained that there was impaired resonance under both clavicles, with harsh and blowing murmur on inspiration, which left little doubt that the pulmonary organs had been long affected, but were now in a quiescent state. His countenance was expressive of much suffering; there was considerable emaciation, great weakness, profuse sweating; and he complained of almost constant spasmodic cough, which shook the entire frame. There was pain and dryness of the larynx and throat, frequent expectoration of purulent mucus, often streaked with blood. Difficult deglutition, especially of fluids, which never failed to excite cough and prolonged spasms. On placing the stethoscope over the larynx, inspiration was accompanied with a hoarse sound; and on inspecting the fauces and pharynx, the mucous surface was seen to be rough, sprinkled over with red prominent follicles, and streaked with adherent purulent mucus.

As this gentleman assured me that the sponge had been daily passed into the larynx by his medical attendant at Torquay, I did not hesitate to introduce it at my first visit. There followed, however, the most violent general spasms, the greatest difficulty in inspiration, rendering suffocation imminent, and then prolonged cough shaking the body, accompanied with purulent expectoration tinged with blood.

The violence of the spasm somewhat abated in from two to three minutes, but he was unable to address me for ten minutes more. He then said that he had never experienced similar sensations previously, and was satisfied that the sponge had never been introduced into the larynx at Torquay, as he had been informed that it had by his medical attendant there. On visiting him the next day, I learned that the local application had been productive of the best effects, that the cough and spasms had entirely ceased, deglutition had been performed with more ease, and that he had passed a better night than he had enjoyed for many months. His appetite, I understood, was not good, and he had for a long time laboured under dyspeptic symptoms. I recommended him to remain quiet, not to speak, and to take a nutritious solid diet. In the course of the night the cough and spasms returned, and next day I again passed the sponge, which once more excited spasms and suffocation, but not to so great an extent as on the former occasion. I continued to pass the sponge every other day, and its good effects were well marked. In a fortnight it excited little irritation, and was invariably succeeded by a sense of ease, diminution of cough, which generally continued to the following night. He was now also enabled to swallow his food with more comfort and more abundantly, and in consequence his general strength was slowly improving.

During the months of April and May, the local application was continued every second or third day. Towards the end of that month he was enabled to take short walks, and instead of my going to him at Morningside, he came into Edinburgh and visited me. I had great difficulty, however, in preventing him from endeavouring to speak, and he was continually exciting the vocal cords. Indeed there could be little doubt that the voice, though not distinct, was much better, and occasionally, on making an effort, he was pleased to hear himself utter articulate sounds. He now changed his residence, and, it is presumed, from having slept in a damp bed-room, or from some other cause, a fresh attack of laryngitis was produced, attended with return of the cough, pain in the throat, and spasms, with fever and great restlessness at night. The

pain was sometimes most severe on the right, at others on the left side, but was diminished by counter-irritants, and afterwards by the local application.

In the middle of June, I found it impossible to pass the sponge fairly into the larynx, and it was singular to observe that the patient became worse, felt more pain, and especially complained of its extending back to the ear. It was apparent to me, however, that the ulcerated surface was cicatrising, although I felt some difficulty in understanding how the glottis was impenetrable. It then occurred to me that probably fungous granulations were obstructing the orifice. One day towards the end of June, he told me that on making a deep inspiration he felt something vibrating at the orifice of the larynx, and it then appeared to me probable that a small polypus had formed there. A few days afterwards, in attempting to pass the sponge, it was ascertained that this was really the case, as he immediately spat up a fleshy mass, the size of a pea, with a small neck at one side. The next day the sponge entered as usual, without any difficulty, and continued to do so till the middle of July, when it again met with an obstruction. His general health, however, had greatly improved; the appetite was tolerably good; the pulmonary signs throughout had remained stationary. In the early part of August he went to the country on a visit, and his health became much improved. During September he visited a hydropathic establishment, and submitted to a course of treatment, consisting of a wet sheet every morning, a sitz bath twice a day, a wet belt round his abdomen worn from morning until dinner time, and a saturated towel round his throat every evening, with walking three times a day in spite of all weathers. This heroic treatment caused the sweating and weakness, which had previously disappeared, again to return. He felt shivering on one occasion, after the sitz bath, and acute pain in his chest, violent cough and epistaxis, which fortunately subsided next day.

On his return early in October, I found him paler and thinner than when I last saw him, the voice, throat, and larynx were in the same condition; but he expressed himself

as having been relieved of his occasional headache and dyspepsia. Towards the latter end of October, however, he complained of severe pain, deep in the nostrils, extending in the direction of the frontal sinus, and backwards to the ear on the left side. This continued to increase, and the discharge from the nose became more abundant, and formed inspissated moulds in the nares during the night, which were with difficulty discharged on the following morning. During November, two pieces of laminated bone were discharged at different times, one from the left nostril, the other by the mouth, it having fallen backwards into the throat. At this period he was seen by Mr Syme, who was of opinion that the vomer was the bone diseased, and that no surgical interference was warrantable.

During the winter of 1852-3, the laryngeal disease continued slowly to improve, the sponge having been passed into the larynx about once a week. His general health also underwent marked improvement, from eating fat pork chops for breakfast. In May following, a third flat piece of bone, about the size of a pea, came from the nose, and a fourth in June. Since then, the discharge from the nostrils has greatly diminished. For the last two months, no applications have been made to the larynx, and he has been travelling through the country. At present (September 1853), his whole appearance is greatly improved. The discharge from the nose is trifling, the mucous membrane of which is apparently healing. The voice has returned, although still hoarse, and liable to crack on speaking for any length of time. The pulmonary disease seems to be permanently arrested.

Such is the present condition of this case, which I regard as one of arrested pulmonary *and* laryngeal phthisis, complicated with ulceration and necrosis of the nasal passages, a complication of disorders which not long ago might well have been considered hopeless. The local treatment of the larynx has, to use his own expression, "made him a new man,"—and it is in this respect that the case is instructive. The removal of the small laryngeal polypus also adds to the interest of this

case. No doubt the severity of the hydropathic treatment exposed him to unnecessary risk; for had a fresh inflammation seized either upon his larynx or lungs, it would have been most injurious if not fatal, and it must be obvious he very narrowly escaped this. On the other hand, his general health was no way improved by it, if we except the better appetite, dependent probably on the increased amount of exercise he was induced to take. During last winter, I recommended his eating pork chops, instead of taking cod-liver oil, and as he relished them, and the appetite remained good, he was conscious of considerable improvement in the nutritive functions.

The local treatment practised in these cases was first recommended by Dr Horace Green of New York. The instruments to be employed are, first, a tongue depressor, with a bent handle, by means of which the tongue can be firmly pressed down, so as to expose the whole of the fauces, and the upper edge of the epiglottis. In doing this, some patients experience no inconvenience, whilst in others there is such excessive irritability, that spasmodic cough or even vomiting is occasioned, which prevents the possibility of seeing the epiglottis. Secondly, a whalebone probang, about ten inches long, having at its extremity a round piece of the finest sponge, about the size of a gun or pistol bullet. The probang, towards the extremity, must be bent in a curve, which, according to Dr Green, ought to form the arc of one quarter of a circle whose diameter is four inches. Sometimes, however, the curve must be altered to suit particular cases. It is important that the sponge be fine, and capable of imbibing a considerable quantity of fluid; that it be *sewn* firmly to the extremity of the whalebone, and that this last should not be cut in the form of a bulb, but tapered as much as is consistent with firmness.

The solutions of the nitrate of silver which will be found most useful are of three strengths. One is formed of $\mathfrak{z}\text{i}$., the second of $\mathfrak{z}\text{ij}$., and the third of $\mathfrak{z}\text{j}$., of the crystallised salt to an ounce of distilled water. On some occasions a solution of the sulphate of copper has been found beneficial, and it is very possible that, as our experience of this kind of treatment

extends, the application of other substances in solution may be found capable of meeting particular indications. Dr Hastings, of London, speaks highly of the bicyanurate of mercury employed in this way, and Dr Scott Alison recommends the occasional use of olive oil.

The method of introducing the sponge which I have found most successful is as follows:—The patient being seated in a chair and exposed to a good light, the medical practitioner should stand on his right side, and depress the tongue with the depressor held in the left hand. Holding the probang in the right hand, the sponge having been saturated in the solution, it should be passed carefully over the upper surface of the instrument, *exactly in the median plane*, until it is above or immediately behind the epiglottis. The patient should be now told to inspire, and as he does so, the tongue should be dragged slightly forwards with the depressor, and the probang thrust downwards and forwards by a movement which causes the right arm to be elevated, and the hand to be brought almost in contact with the patient's face. This operation requires more dexterity than may at first be supposed. The rima glottidis is narrow, and unless the sponge come fairly down upon it, it readily slips into the œsophagus. Its passage into the proper channel may be determined by the sensation of overcoming a constriction, which is experienced when the sponge is momentarily embraced by the rima, as well as by the momentary spasm it occasions in the patient, or the harsh expiration which follows—symptoms which are more marked according to the sensibility of the parts. Some individuals are so irritable that the pressure of the spatula on the tongue causes vomiting or œsophagial spasm. In such persons, I have succeeded, after teaching them how to breathe and hold the mouth, in passing the sponge without the use of any other instrument.

If the probang be properly prepared, and the operation well performed, the actions which take place are as follows:—1st, The sponge, saturated with the solution, is rapidly thrust through the rima into the larynx, and frequently into the trachea; for if the distance of the probang be measured from

that portion of it which comes in contact with the lips, the extent it has been thrust downwards can be pretty accurately determined. I am persuaded that on many occasions I have passed it pretty deep into the trachea, not only from the length of the probang which has disappeared, but also from the sensations of the patient, although this may be thought by some a fallacious method of determining the point. In this first part of the operation, the rima glottidis is, as it were, taken by surprise, and the sponge enters, if the right direction be given to it, without difficulty. But, 2d, the rima glottidis immediately contracts by reflex action, so that, on withdrawing the instrument, you feel the constriction. This also squeezes out the solution, which is diffused over the laryngeal and tracheal mucous membrane. Now, if the sponge be a fine one, it will be found capable of holding about ʒss. of fluid, the effect of which upon the secretions and mucous surface almost always produces temporary relief to the symptoms, and strengthens the tone of the voice—results at once apparent after the momentary spasm has abated. 3d, The action of the nitrate of silver solution is not that of a stimulant, but rather that of a calmative or sedative. It acts chemically on the mucus, pus, or other albuminous fluids it comes in contact with, throws down a copious white precipitate, in the form of a molecular membrane, which defends for a time the tender mucous surface or irritable ulcer, and leaves the passage free for the acts of respiration. Hence the feeling of relief almost always occasioned; that diminution of irritability in the parts which is so favourable to cure, and why it is that strong solutions of the salt are much more efficacious than weak ones. It may be easily conceived that such good effects must be more or less advantageous in almost all the diseases that affect parts so sensitive, from whatever cause they may arise; and that this treatment is not adapted to one or more diseases of the larynx, but, like all important remedies, meets a general indication which the judicious practitioner will know how to avail himself of.

The mucous membrane of the larynx consists of ciliated epithelium externally, a basement layer below this, and areolar

tissue internally, richly supplied with blood-vessels. Scattered over its surface are numerous follicles, which secrete mucus. It is liable to the same structural alterations as all other similar membranes, which may be divided into—1st, Exudation into the areolar tissue, between the basement membrane and epithelium, or upon the external surface; 2d, Abrasions or desquamations of the epithelial layer; 3d, Ulcerations extending more or less deep into the areolar tissue; and 4th, Obstruction, swelling, and subsequent ulceration of the mucous follicles, a lesion particularly described by Dr Horace Green, and denominated by him “follicular disease of the air-passages.” These different lesions may be more or less complicated with each other, and will vary in intensity according to the rapidity of their progress, and the extent to which the mucous membrane is implicated. Sometimes the exudation is thrown out quickly, and infiltrates the textures, as in œdema glottidis, or in malignant angina. At other times it is poured out on the surface, as in croup. More frequently it is partial, occasioning subsequent abrasion or ulceration, and is allowed to become chronic. Perhaps the most common form it assumes, is when it is chronic from the commencement, sometimes dependent on atmospheric changes, at others following repeated attacks of “cold;” in a third class dependent on too much straining of voice, as occurs in public speakers, clergymen, singers, etc., and occasionally is connected with some general constitutional disorder, as syphilis, tuberculosis, or some form of cancer. All these forms of laryngeal disease may be further associated with similar lesions of the fauces, tonsils, uvula, and pharynx.

The symptoms will of course vary according to these different circumstances. The acute forms are accompanied with general fever, considerable local pain, more or less obstruction to deglutition and respiration, and loss or alteration in the character of the voice. As a general rule, it may be said that lesions of the fauces, tonsils, and neighbouring parts, are indicated by greater or less difficulty or uneasiness in swallowing, whilst the laryngeal disorder is evinced by changes in the character or power of sustaining the voice. Then, as a common

result of the local irritation, spasmodic action is evinced, and we have cough, at first dry, but afterwards attended with mucous or purulent expectoration, and not unfrequently with discharge of blood. This last symptom has been far too generally considered as evidence of a pulmonary lesion, an occasional error that was well pointed out by Dr Neligan,¹ of Dublin, and has been ably treated of by Dr J. Hastings,² of London. Elongation of the uvula may produce many of these effects. In the more acute and extensive cases of exudative laryngitis, the spasms are more violent and prolonged, and the greatest caution is necessary in watching persons so affected, lest, from sudden and continued closure of the glottis, fatal asphyxia be induced.

These considerations, and the cases previously given, with others that might have been adduced, have satisfied me that lesions of the pharynx and larynx ought to occupy the serious attention of the practitioner in all cases of pulmonary diseases, and that the following practical conclusions may be drawn from them :—

1st, That not unfrequently diseases, entirely seated in the larynx or pharynx, are mistaken for pulmonary tuberculosis.

2d, That even when pulmonary tuberculosis exists, many of the urgent symptoms are not so much owing to disease in the lung as to the pharyngeal and laryngeal complications.

3d, That a local treatment may not only remove or alleviate these complications, but that, in conjunction with general remedies, it tends in a marked manner to induce arrestment of the pulmonary disease.

¹ Dublin Quarterly Journal, May 1850, p. 357.

² On Diseases of the Larynx and Trachea, 1850, p. 88, *et seq.*

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